THE POINT – SOUTH PKG 1

ROLESVILLE, NORTH CAROLINA

STORM DRAINAGE CALCULATIONS

PROJECT NUMBER: AWH-20000
DESIGNED BY: W. T. O'DANIEL, PE

DATE: NOVEMBER 25, 2020

Todd O'Daniel
Nov 25 2020 1:56 PM

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MCADAMS
2905 MERIDIAN PARKWAY
DURHAM, NORTH CAROLINA 27713
NC LIC. # C-0293

THE POINT SOUTH – PKG 1

STORM DRAINAGE SYSTEM CALCULATIONS

GENERAL DESCRIPTION

The Point site is located along NC HWY 401 (Louisburg Road) and west of East Young Street in Rolesville, North Carolina. The proposed development at The Point is approximately 300 acres, divided into two section with one to the north of NC HWY 401 (The Point – North) and another to th south of NC HWY 401 (The Point - South) This storm drainage analysis includes CD Package 1 of the The Point – South only. The total development will consist of approximately 804 lots, a mixture of townhomes and various types of single-family housing, thirteen stormwater control measures, sidewalks, roadways, greenway trail, and associated infrastructure and various amenities.

The Point South – Pkg 1 development is located within the Neuse River basin with the site's stormwater runoff draining into Harris Creek. The proposed development shall be subject to storm drainage requirements set forth in the Rolesville Unified Development Ordinance.

CALCULATION METHODOLOGY

- Rainfall data for the Wendell, NC region was taken from NOAA Atlas 14. This data describes a depth-duration-frequency (DDF) table describing rainfall depth versus time for varying return periods in the Wendell, NC area. These rainfall depths are entered into the Hydraflow Storm Sewers to determine design flows associated with the storm drainage system. Please reference the rainfall data section within this report for additional information.

- The time of concentration was calculated using the Kirpich Method.

- The existing on-site topography used in the analysis is from a field survey by The John R. McAdams Company, Inc. and local GIS data.

- For each individual storm drainage inlet, a drainage area was measured as well as assigning impervious surface percentage. From this impervious percentage, a rational c factor was calculated based on 0.95 for impervious areas. For drainage areas with a combination of both pervious (Open Space and Lawns, C=0.35) and impervious areas, a composite "c" factor was interpolated.

- The pipes were sized using Hydraflow Storm Sewers 2019. This program accepts the input data from each inlet, as well as physical characteristics of the storm system to be designed, and calculates flow rates and pipe sizes throughout the system. The final results of this program as well as calculated pipe sizes and hydraulic grade lines may be found in the appropriate section of this report. The minimum pipe size was 15" unless otherwise shown on the plans. Pipe material is RCP as noted on the plans.

- The inlet types included for this project are primarily NCDOT type combination catch basins with curb inlets and grates. The calculations include an analysis to determine gutter spread at these inlets based on a 4-in per hour rainfall intensity.

- The storm water network was analyzed for the 10-year storm event using a starting time of concentration of 5 minutes.

- The various inlet types are shown on the stormwater detail sheets, within the plan set. Flared end sections or Endwalls are used at discharge points. Headwalls or structures are used at inlet points. Velocity dissipators are provided at discharge points to prevent erosion and scour in these areas. The dissipators have been sized using the NYDOT method.

PRECIPITATION FREQUENCY DATA TABLES

NOAA Atlas 14, Volume 2, Version 3
Location name: Wake Forest, North Carolina, USA*
Latitude: 35.9088°, Longitude: -78.4485°
Elevation: 405.98 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.84** (4.43-5.29)	**5.62** (5.15-6.14)	**6.41** (5.87-6.98)	**7.19** (6.58-7.85)	**7.98** (7.27-8.70)	**8.62** (7.81-9.40)	**9.18** (8.28-10.0)	**9.68** (8.68-10.6)	**10.2** (9.10-11.2)	**10.7** (9.46-11.7)
10-min	**3.86** (3.54-4.23)	**4.49** (4.12-4.91)	**5.13** (4.70-5.59)	**5.75** (5.26-6.28)	**6.36** (5.80-6.94)	**6.86** (6.22-7.48)	**7.29** (6.58-7.95)	**7.67** (6.88-8.37)	**8.09** (7.19-8.84)	**8.45** (7.45-9.25)
15-min	**3.22** (2.95-3.52)	**3.77** (3.45-4.12)	**4.32** (3.96-4.72)	**4.85** (4.44-5.29)	**5.38** (4.90-5.86)	**5.79** (5.25-6.31)	**6.14** (5.54-6.70)	**6.45** (5.78-7.04)	**6.79** (6.04-7.42)	**7.07** (6.23-7.74)
30-min	**2.21** (2.02-2.42)	**2.60** (2.38-2.84)	**3.07** (2.81-3.35)	**3.51** (3.21-3.83)	**3.98** (3.63-4.34)	**4.36** (3.96-4.75)	**4.71** (4.24-5.13)	**5.02** (4.50-5.48)	**5.40** (4.80-5.90)	**5.73** (5.05-6.27)
60-min	**1.38** (1.26-1.51)	**1.63** (1.50-1.78)	**1.97** (1.80-2.15)	**2.29** (2.09-2.50)	**2.65** (2.41-2.89)	**2.96** (2.68-3.22)	**3.24** (2.92-3.53)	**3.52** (3.16-3.84)	**3.88** (3.45-4.23)	**4.18** (3.68-4.57)
2-hr	**0.805** (0.732-0.888)	**0.957** (0.874-1.05)	**1.17** (1.06-1.28)	**1.37** (1.25-1.50)	**1.61** (1.46-1.77)	**1.83** (1.64-2.00)	**2.03** (1.81-2.22)	**2.24** (1.99-2.45)	**2.52** (2.21-2.75)	**2.76** (2.40-3.02)
3-hr	**0.568** (0.516-0.629)	**0.676** (0.617-0.746)	**0.828** (0.753-0.913)	**0.980** (0.889-1.08)	**1.16** (1.05-1.28)	**1.33** (1.19-1.46)	**1.49** (1.33-1.64)	**1.66** (1.47-1.82)	**1.89** (1.65-2.08)	**2.10** (1.81-2.31)
6-hr	**0.342** (0.312-0.378)	**0.407** (0.372-0.448)	**0.499** (0.455-0.548)	**0.591** (0.537-0.648)	**0.705** (0.637-0.772)	**0.808** (0.726-0.884)	**0.912** (0.811-0.996)	**1.02** (0.900-1.11)	**1.17** (1.02-1.27)	**1.31** (1.12-1.43)
12-hr	**0.200** (0.183-0.221)	**0.238** (0.219-0.262)	**0.293** (0.269-0.322)	**0.350** (0.319-0.383)	**0.420** (0.381-0.459)	**0.485** (0.436-0.528)	**0.551** (0.490-0.599)	**0.622** (0.547-0.675)	**0.719** (0.622-0.781)	**0.809** (0.690-0.880)
24-hr	**0.119** (0.111-0.128)	**0.144** (0.134-0.155)	**0.181** (0.168-0.195)	**0.210** (0.195-0.227)	**0.251** (0.232-0.270)	**0.283** (0.261-0.304)	**0.316** (0.290-0.340)	**0.350** (0.321-0.378)	**0.398** (0.362-0.429)	**0.436** (0.395-0.471)
2-day	**0.069** (0.064-0.074)	**0.083** (0.078-0.090)	**0.104** (0.097-0.112)	**0.120** (0.111-0.129)	**0.142** (0.132-0.153)	**0.160** (0.147-0.172)	**0.178** (0.164-0.192)	**0.197** (0.180-0.212)	**0.223** (0.203-0.241)	**0.243** (0.220-0.263)
3-day	**0.049** (0.046-0.052)	**0.059** (0.055-0.063)	**0.073** (0.068-0.078)	**0.084** (0.078-0.090)	**0.099** (0.092-0.107)	**0.112** (0.103-0.120)	**0.124** (0.114-0.133)	**0.137** (0.126-0.147)	**0.155** (0.141-0.167)	**0.169** (0.154-0.183)
4-day	**0.039** (0.036-0.041)	**0.046** (0.043-0.050)	**0.057** (0.054-0.061)	**0.066** (0.062-0.071)	**0.078** (0.072-0.083)	**0.088** (0.081-0.094)	**0.097** (0.090-0.104)	**0.107** (0.099-0.115)	**0.121** (0.111-0.130)	**0.132** (0.120-0.142)
7-day	**0.026** (0.024-0.027)	**0.031** (0.029-0.033)	**0.037** (0.035-0.040)	**0.043** (0.040-0.046)	**0.050** (0.047-0.054)	**0.056** (0.052-0.060)	**0.062** (0.057-0.066)	**0.068** (0.063-0.073)	**0.077** (0.070-0.082)	**0.084** (0.076-0.090)
10-day	**0.020** (0.019-0.022)	**0.024** (0.023-0.026)	**0.029** (0.027-0.031)	**0.033** (0.031-0.035)	**0.039** (0.036-0.041)	**0.043** (0.040-0.046)	**0.047** (0.044-0.050)	**0.051** (0.047-0.055)	**0.057** (0.053-0.061)	**0.062** (0.057-0.066)
20-day	**0.014** (0.013-0.015)	**0.016** (0.015-0.017)	**0.019** (0.018-0.020)	**0.022** (0.020-0.023)	**0.025** (0.023-0.026)	**0.027** (0.025-0.029)	**0.030** (0.028-0.032)	**0.032** (0.030-0.035)	**0.036** (0.033-0.038)	**0.039** (0.036-0.041)
30-day	**0.011** (0.011-0.012)	**0.013** (0.013-0.014)	**0.016** (0.015-0.017)	**0.017** (0.016-0.018)	**0.020** (0.018-0.021)	**0.021** (0.020-0.023)	**0.023** (0.022-0.025)	**0.025** (0.023-0.026)	**0.027** (0.025-0.029)	**0.029** (0.027-0.031)
45-day	**0.010** (0.009-0.010)	**0.011** (0.011-0.012)	**0.013** (0.012-0.014)	**0.014** (0.013-0.015)	**0.016** (0.015-0.017)	**0.017** (0.016-0.018)	**0.018** (0.017-0.019)	**0.020** (0.018-0.021)	**0.021** (0.020-0.023)	**0.022** (0.021-0.024)
60-day	**0.009** (0.008-0.009)	**0.010** (0.010-0.011)	**0.011** (0.011-0.012)	**0.013** (0.012-0.013)	**0.014** (0.013-0.015)	**0.015** (0.014-0.016)	**0.016** (0.015-0.017)	**0.017** (0.016-0.018)	**0.018** (0.017-0.019)	**0.019** (0.018-0.020)

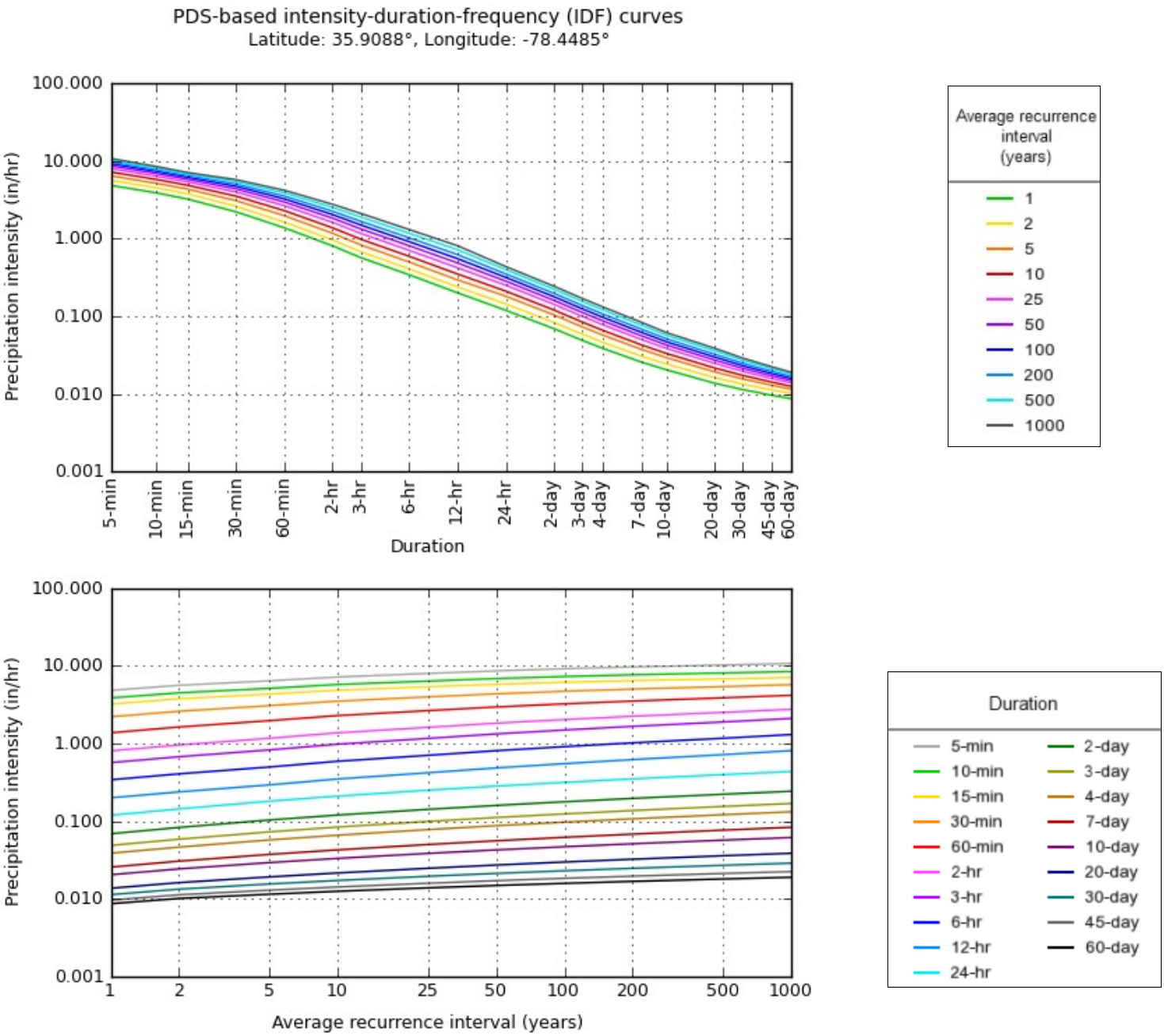
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



NOAA Atlas 14, Volume 2, Version 3

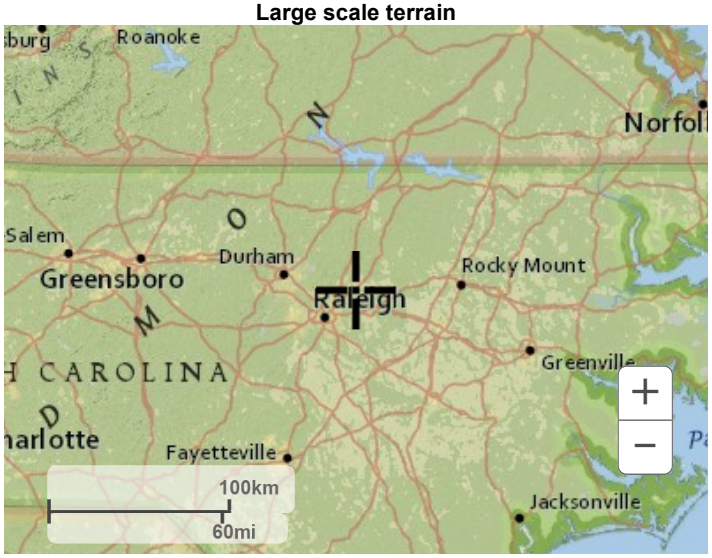
Created (GMT): Thu Oct 29 20:52:01 2020

Back to Top

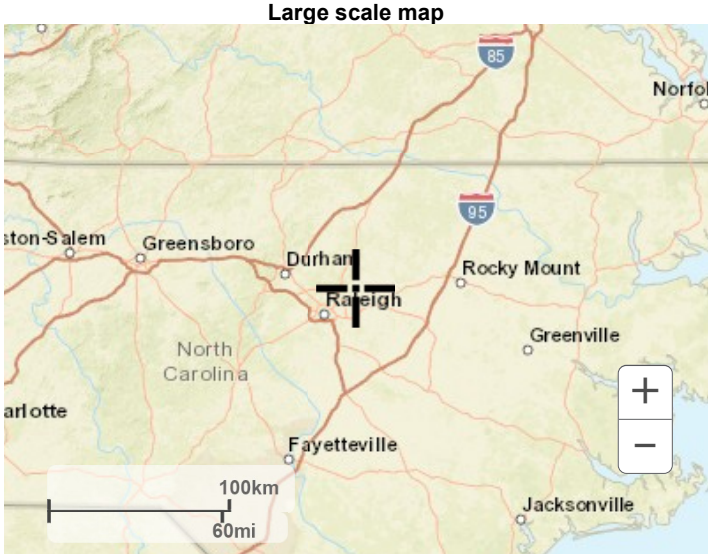
Maps & aerials

Small scale terrain

Large scale terrain



Large scale map



Large scale aerial

Back to Top

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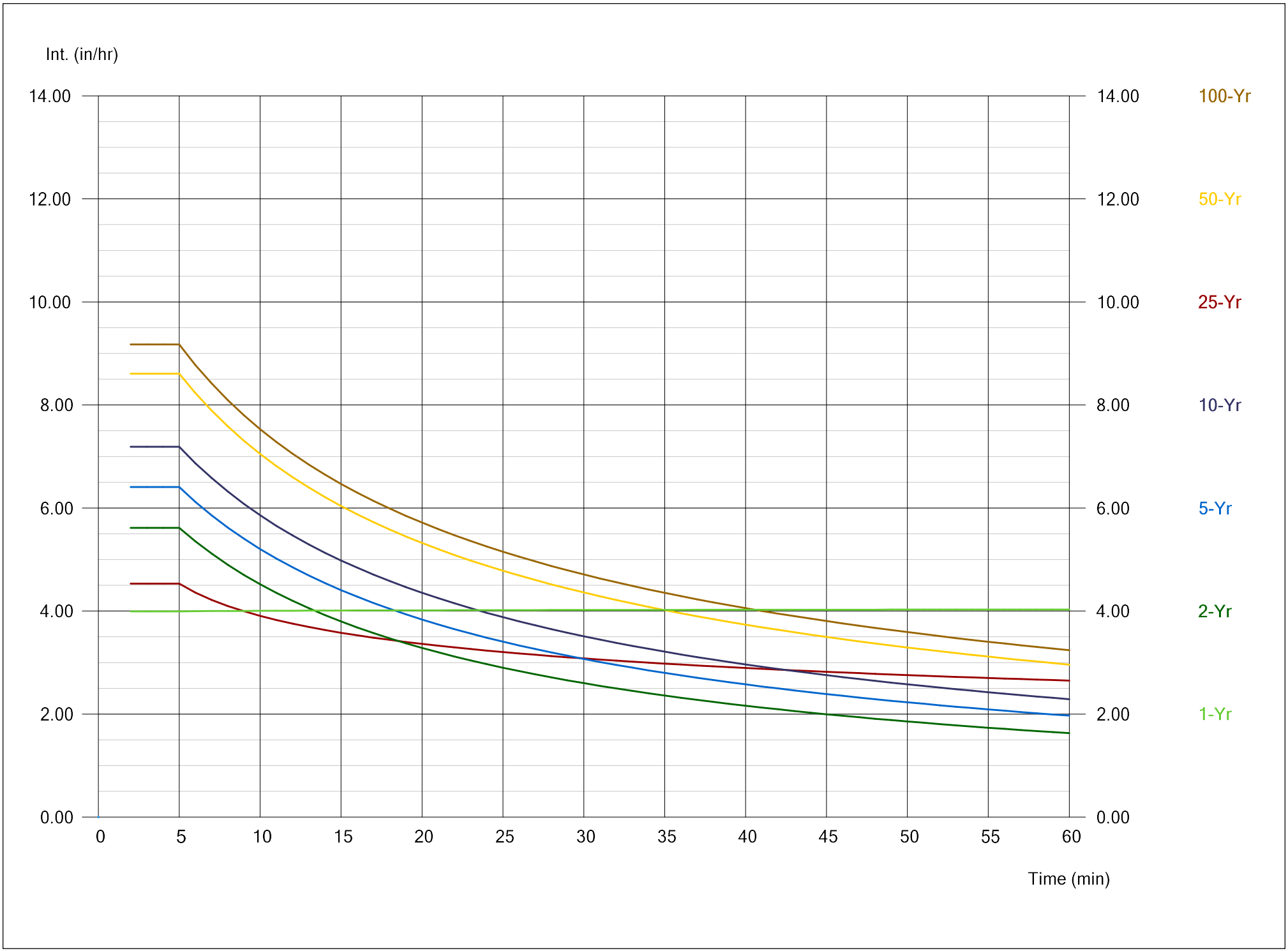
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

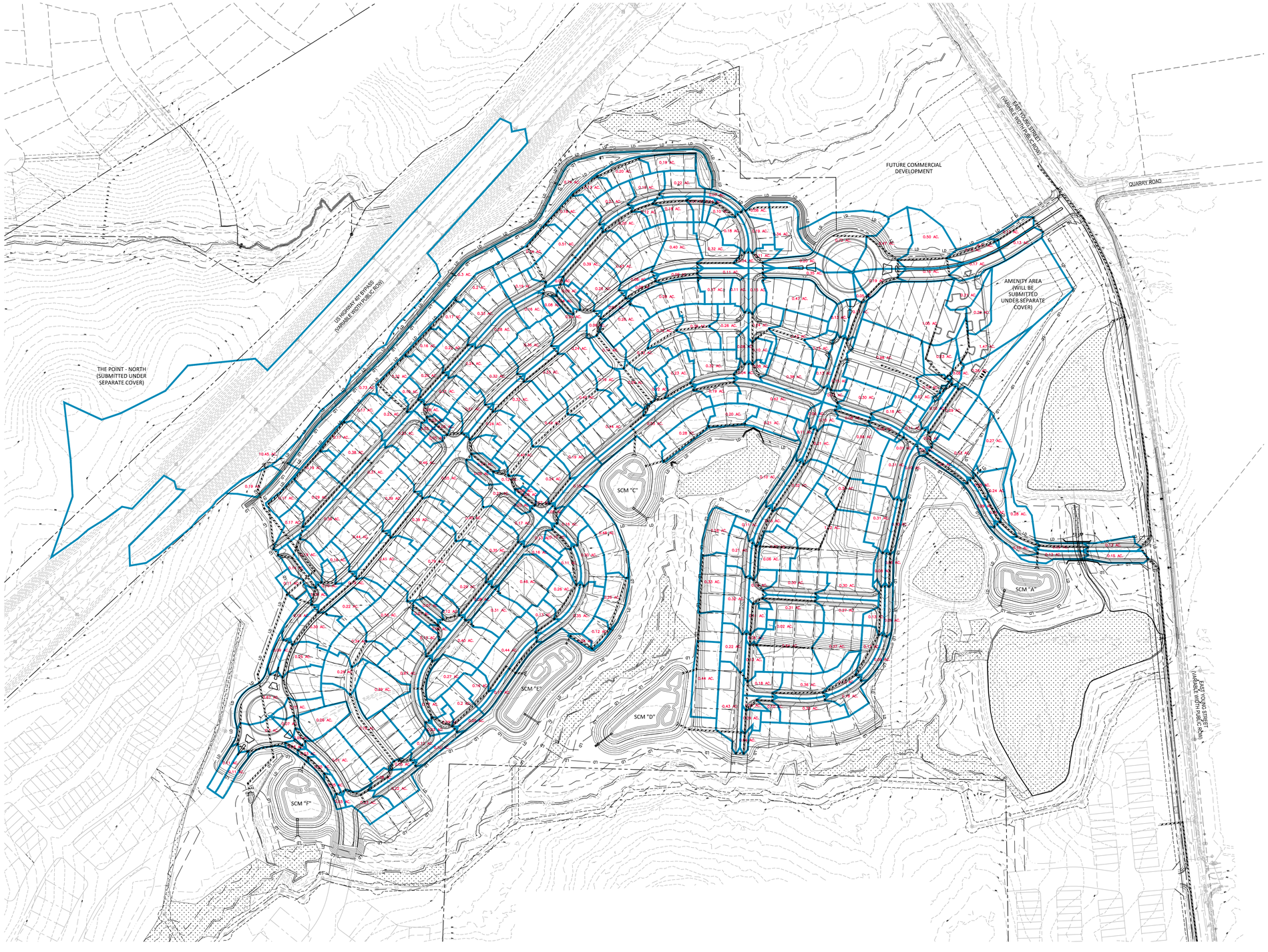
Disclaimer

Storm Sewer IDF Curves

IDF file: The Point.IDF



DRAINAGE AREA MAP



GRAPHIC SCALE
0 75 150 300
1 inch = 150 ft.

FINAL DRAWING - NOT RELEASED FOR CONSTRUCTION

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ASHTON WOODS

THE POINT
PHASES 1-10 AND 14
CONSTRUCTION DRAWINGS - PACKAGE 1
EAST YOUNG STREET
TOWN OF ROLESVILLE, WAKE FOREST TOWNSHIP,
WAKE COUNTY, NORTH CAROLINA

REVISIONS

NO.	DATE

PLAN INFORMATION

PROJECT NO.	AWH-20000
FILENAME	AWH-20000 STORM DRAINAGE AREA MAP2
CHECKED BY	.
DRAWN BY	.
SCALE	1"=150'
DATE	11. 25. 2020

SHEET

OVERALL
DRAINAGE AREA MAP
1 OF 1

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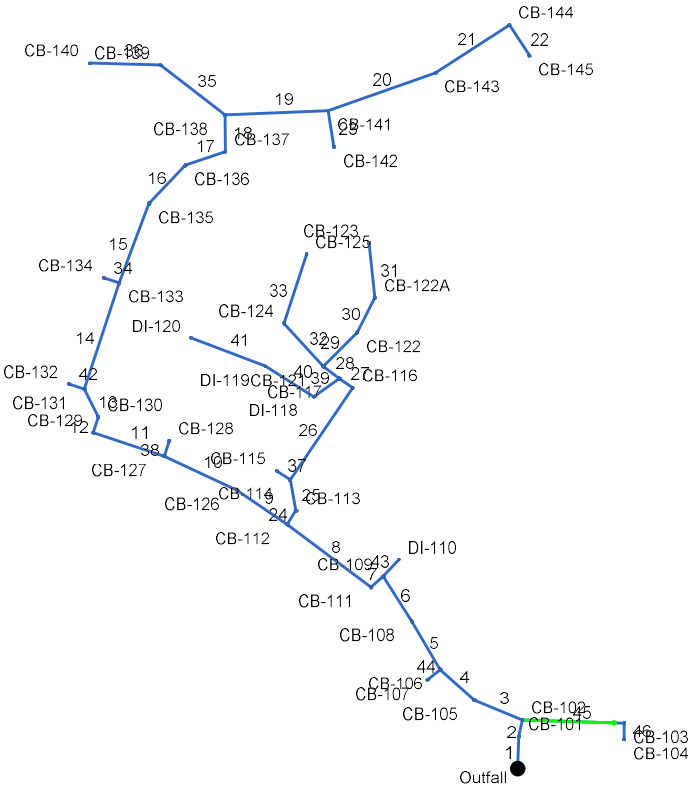
SYSTEM 100 – REPORTS AND PROFILES

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: Storm System 100.stm	Number of lines: 46	Date: 11/23/2020

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	100-101	32.21	54	Cir	48.439	380.00	380.30	0.620	384.13	381.93	0.30	381.93	End	Combination
2	101-102	31.91	36	Cir	24.500	380.50	380.65	0.600	382.21	382.48	n/a	382.48	1	Combination
3	102-105	30.47	36	Cir	76.900	381.15	381.65	0.645	382.77	383.43	n/a	383.43	2	Combination
4	105-106	29.89	36	Cir	68.369	381.75	382.15	0.585	383.43	383.92	1.09	383.92	3	Combination
5	106-108	29.59	36	Cir	83.524	382.25	382.75	0.600	383.92	384.51	n/a	384.51	4	Combination
6	108-109	29.63	36	Cir	78.768	382.85	383.30	0.575	384.51	385.06	1.61	385.06	5	Combination
7	109-111	29.05	36	Cir	24.500	383.40	383.55	0.600	385.06	385.29	n/a	385.29	6	Combination
8	111-112	29.16	36	Cir	155.766	383.65	385.15	0.966	385.29	386.90	1.09	386.90	7	Combination
9	112-126	12.38	24	Cir	90.492	385.65	386.20	0.611	386.90	387.46	0.27	387.46	8	Combination
10	126-127	12.51	24	Cir	119.631	386.30	387.00	0.583	387.56	388.27	0.82	388.27	9	Combination
11	127-129	11.69	24	Cir	111.562	387.10	387.75	0.582	388.30	388.97	0.78	388.97	10	Combination
12	129-130	11.39	24	Cir	24.500	387.85	388.00	0.641	389.00	389.21	n/a	389.21	11	Combination
13	130-131	10.42	24	Cir	46.317	388.10	388.40	0.643	389.21	389.56	n/a	389.56	12	Combination
14	131-133	9.51	24	Cir	166.000	388.50	389.50	0.600	389.56	390.60	0.67	390.60	13	Combination
15	133-135	8.72	24	Cir	125.505	389.60	390.30	0.560	390.62	391.35	0.28	391.35	14	Combination
16	135-136	8.61	24	Cir	78.741	390.40	390.80	0.511	391.44	391.85	0.33	391.85	15	Combination
17	136-137	7.89	24	Cir	62.728	390.90	391.30	0.632	391.85	392.30	0.57	392.30	16	Combination
18	137-138	7.19	18	Cir	54.500	392.00	392.40	0.728	393.02	393.43	n/a	393.43	17	Combination
19	138-141	2.84	15	Cir	153.469	396.60	401.80	3.390	397.02	402.48	n/a	402.48	18	Combination
20	141.143	1.42	15	Cir	169.944	402.00	403.00	0.594	402.48	403.48	n/a	403.48 j	19	Combination
21	143-144	1.46	15	Cir	131.354	403.10	403.90	0.608	403.57	404.38	n/a	404.38	20	Combination
22	144-145	0.78	15	Cir	54.500	404.00	404.35	0.637	404.38	404.70	n/a	404.70 j	21	Combination
23	141-142	1.01	15	Cir	54.497	401.90	402.25	0.637	402.48	402.65	n/a	402.65 j	19	Combination
24	112-113	20.86	30	Cir	24.511	387.00	387.15	0.600	388.48	388.70	n/a	388.70	8	Combination

Project File: Storm System 100.stm | Number of lines: 46 | Run Date: 11/23/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	113-114	20.76	30	Cir	46.478	387.25	387.55	0.643	388.70	389.09	n/a	389.09	24	Combination
26	114-116	19.55	30	Cir	165.333	387.65	388.65	0.606	389.09	390.15	n/a	390.15	25	Combination
27	116-117	18.48	30	Cir	24.500	388.75	388.90	0.600	390.15	390.35	0.86	390.35	26	Combination
28	117-121	13.00	24	Cir	29.840	394.80	395.40	2.011	395.69	396.70	n/a	396.70	27	Combination
29	121-122	8.61	18	Cir	71.402	395.95	396.90	1.330	396.88	398.03	0.31	398.03	28	Combination
30	122-122A	2.32	15	Cir	58.194	397.20	398.90	2.913	398.03	399.50	n/a	399.50 j	29	Combination
31	122A-123	1.23	15	Cir	81.000	399.00	400.50	1.858	399.50	400.94	n/a	400.94 j	30	Combination
32	121-124	3.87	15	Cir	86.832	396.25	397.05	0.921	396.97	397.84	0.46	397.84	28	Combination
33	124-125	0.91	15	Cir	108.000	397.15	399.10	1.806	397.84	399.47	n/a	399.47 j	32	Combination
34	133-134	0.72	15	Cir	24.500	393.95	394.10	0.600	394.27	394.43	0.12	394.43	14	Combination
35	138-139	3.95	15	Cir	121.940	392.50	393.20	0.575	393.43	394.01	0.32	394.34	18	Combination
36	139-140	2.59	15	Cir	105.290	393.30	393.95	0.619	394.34	394.59	n/a	394.59	35	Combination
37	114-115	0.58	15	Cir	24.509	392.15	392.30	0.600	392.44	392.60	n/a	392.60	25	Combination
38	127-128	0.93	15	Cir	24.500	391.55	391.70	0.600	391.92	392.08	n/a	392.08	10	Combination
39	117-118	5.67	18	Cir	46.711	389.90	390.20	0.643	390.80	391.11	0.55	391.11	27	DropGrate
40	118-119	5.67	18	Cir	85.367	390.30	390.80	0.588	391.22	391.73	0.19	391.92	39	DropGrate
41	119-120	4.79	15	Cir	118.535	391.15	391.85	0.591	392.14	392.84	0.33	393.17	40	DropGrate
42	131-132	0.75	15	Cir	24.500	390.25	390.40	0.600	390.58	390.74	n/a	390.74	13	Combination
43	109-110	0.68	15	Cir	34.412	387.55	387.75	0.571	387.87	388.07	0.11	388.07	6	DropGrate
44	106-107	0.54	15	Cir	24.500	385.60	385.75	0.612	385.88	386.04	n/a	386.04	4	Combination
45	102-103	1.22	18	Cir	152.566	381.20	382.00	0.524	382.48	382.41	n/a	382.41	2	Combination
46	103-104	0.74	15	Cir	24.500	382.10	382.25	0.612	382.42	382.59	0.12	382.59	45	Combination

Project File: Storm System 100.stm | Number of lines: 46 | Run Date: 11/23/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	48.439	0.10	10.65	0.80	0.08	6.90	5.0	17.3	4.7	32.21	154.9	4.16	54	0.62	380.00	380.30	384.13	381.93	384.50	388.22	100-101
2	1	24.500	0.28	10.55	0.65	0.18	6.82	5.0	17.2	4.7	31.91	51.66	7.38	36	0.60	380.50	380.65	382.21	382.48	388.22	388.22	101-102
3	2	76.900	0.24	10.05	0.69	0.17	6.46	5.0	16.9	4.7	30.47	53.55	7.38	36	0.64	381.15	381.65	382.77	383.43	388.22	389.06	102-105
4	3	68.369	0.05	9.81	0.84	0.04	6.30	5.0	16.7	4.7	29.89	51.03	7.10	36	0.59	381.75	382.15	383.43	383.92	389.06	390.03	105-106
5	4	83.524	0.05	9.67	0.84	0.04	6.18	5.0	16.4	4.8	29.59	51.66	7.09	36	0.60	382.25	382.75	383.92	384.51	390.03	391.60	106-108
6	5	78.768	0.05	9.62	0.83	0.04	6.14	5.0	16.1	4.8	29.63	50.56	7.13	36	0.57	382.85	383.30	384.51	385.06	391.60	393.00	108-109
7	6	24.500	0.09	9.30	0.84	0.08	6.00	5.0	16.0	4.8	29.05	51.66	7.03	36	0.60	383.40	383.55	385.06	385.29	393.00	393.00	109-111
8	7	155.766	0.02	9.21	0.88	0.02	5.93	5.0	15.4	4.9	29.16	65.55	7.09	36	0.97	383.65	385.15	385.29	386.90	393.00	395.85	111-112
9	8	90.492	0.01	3.85	0.70	0.01	2.49	5.0	15.1	5.0	12.38	17.68	5.95	24	0.61	385.65	386.20	386.90	387.46	395.85	396.60	112-126
10	9	119.631	0.08	3.84	0.80	0.06	2.48	5.0	14.6	5.0	12.51	17.27	5.97	24	0.58	386.30	387.00	387.56	388.27	396.60	395.96	126-127
11	10	111.562	0.08	3.58	0.81	0.06	2.29	5.0	14.2	5.1	11.69	17.26	5.84	24	0.58	387.10	387.75	388.30	388.97	395.96	393.98	127-129
12	11	24.500	0.30	3.50	0.68	0.20	2.22	5.0	14.1	5.1	11.39	18.11	5.91	24	0.64	387.85	388.00	389.00	389.21	393.98	393.98	129-130
13	12	46.317	0.15	3.20	0.78	0.12	2.02	5.0	13.8	5.2	10.42	18.14	5.68	24	0.64	388.10	388.40	389.21	389.56	393.98	394.64	130-131
14	13	166.000	0.11	2.92	0.78	0.09	1.80	5.0	13.0	5.3	9.51	17.52	5.51	24	0.60	388.50	389.50	389.56	390.60	394.64	398.34	131-133
15	14	125.505	0.05	2.68	0.84	0.04	1.61	5.0	12.4	5.4	8.72	16.93	5.31	24	0.56	389.60	390.30	390.62	391.35	398.34	400.55	133-135
16	15	78.741	0.19	2.63	0.78	0.15	1.57	5.0	11.9	5.5	8.61	16.17	5.20	24	0.51	390.40	390.80	391.44	391.85	400.55	400.86	135-136
17	16	62.728	0.16	2.44	0.84	0.13	1.42	5.0	11.6	5.5	7.89	17.98	5.22	24	0.63	390.90	391.30	391.85	392.30	400.86	400.88	136-137
18	17	54.500	0.50	2.28	0.45	0.23	1.29	5.0	11.4	5.6	7.19	8.96	5.58	18	0.73	392.00	392.40	393.02	393.43	400.88	400.88	137-138
19	18	153.469	0.15	0.59	0.83	0.12	0.49	5.0	10.4	5.8	2.84	11.89	6.07	15	3.39	396.60	401.80	397.02	402.48	400.88	406.49	138-141
20	19	169.944	0.01	0.27	0.90	0.01	0.23	5.0	8.2	6.3	1.42	4.98	3.29	15	0.59	402.00	403.00	402.48	403.48	406.49	409.63	141.143
21	20	131.354	0.13	0.26	0.83	0.11	0.22	5.0	6.4	6.7	1.46	5.03	3.47	15	0.61	403.10	403.90	403.57	404.38	409.63	408.60	143-144
22	21	54.500	0.13	0.13	0.84	0.11	0.11	5.0	5.0	7.2	0.78	5.15	2.67	15	0.64	404.00	404.35	404.38	404.70	408.60	408.60	144-145

Project File: Storm System 100.stm

Number of lines: 46

Run Date: 11/23/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	19	54.497	0.17	0.17	0.83	0.14	0.14	5.0	5.0	7.2	1.01	5.15	2.44	15	0.64	401.90	402.25	402.48	402.65	406.49	406.49	141-142
24	8	24.511	0.05	5.34	0.78	0.04	3.42	5.0	8.9	6.1	20.86	31.77	6.71	30	0.60	387.00	387.15	388.48	388.70	395.85	395.86	112-113
25	24	46.478	0.29	5.29	0.67	0.19	3.38	5.0	8.7	6.1	20.76	32.89	6.77	30	0.64	387.25	387.55	388.70	389.09	395.86	396.54	113-114
26	25	165.333	0.26	4.90	0.70	0.18	3.10	5.0	8.1	6.3	19.55	31.93	6.50	30	0.61	387.65	388.65	389.09	390.15	396.54	399.80	114-116
27	26	24.500	0.06	4.64	0.85	0.05	2.92	5.0	8.0	6.3	18.48	31.77	6.39	30	0.60	388.75	388.90	390.15	390.35	399.80	399.80	116-117
28	27	29.840	0.23	3.40	0.65	0.15	2.05	5.0	7.9	6.4	13.00	32.07	7.85	24	2.01	394.80	395.40	395.69	396.70	399.80	400.48	117-121
29	28	71.402	1.47	1.91	0.65	0.96	1.30	5.0	6.8	6.6	8.61	12.11	6.72	18	1.33	395.95	396.90	396.88	398.03	400.48	401.40	121-122
30	29	58.194	0.22	0.44	0.78	0.17	0.34	5.0	6.3	6.8	2.32	11.02	3.29	15	2.91	397.20	398.90	398.03	399.50	401.40	403.24	122-122A
31	30	81.000	0.22	0.22	0.78	0.17	0.17	5.0	5.0	7.2	1.23	8.80	2.92	15	1.86	399.00	400.50	399.50	400.94	403.24	404.76	122A-123
32	28	86.832	1.05	1.26	0.45	0.47	0.60	5.0	7.4	6.5	3.87	6.20	5.01	15	0.92	396.25	397.05	396.97	397.84	400.48	401.32	121-124
33	32	108.000	0.21	0.21	0.60	0.13	0.13	5.0	5.0	7.2	0.91	8.68	2.12	15	1.81	397.15	399.10	397.84	399.47	401.32	403.34	124-125
34	14	24.500	0.13	0.13	0.77	0.10	0.10	5.0	5.0	7.2	0.72	5.00	2.83	15	0.60	393.95	394.10	394.27	394.43	398.34	398.34	133-134
35	18	121.940	0.47	1.19	0.45	0.21	0.57	5.0	5.8	6.9	3.95	4.90	4.33	15	0.58	392.50	393.20	393.43	394.01	400.88	399.03	138-139
36	35	105.290	0.72	0.72	0.50	0.36	0.36	5.0	5.0	7.2	2.59	5.08	3.22	15	0.62	393.30	393.95	394.34	394.59	399.03	398.19	139-140
37	25	24.509	0.10	0.10	0.81	0.08	0.08	5.0	5.0	7.2	0.58	5.00	2.66	15	0.60	392.15	392.30	392.44	392.60	396.54	396.53	114-115
38	10	24.500	0.18	0.18	0.72	0.13	0.13	5.0	5.0	7.2	0.93	5.00	3.04	15	0.60	391.55	391.70	391.92	392.08	395.96	395.96	127-128
39	27	46.711	0.02	1.18	0.88	0.02	0.82	5.0	6.0	6.9	5.67	8.42	5.06	18	0.64	389.90	390.20	390.80	391.11	399.80	398.01	117-118
40	39	85.367	0.18	1.16	0.78	0.14	0.81	5.0	5.5	7.0	5.67	8.05	4.93	18	0.59	390.30	390.80	391.22	391.73	398.01	396.65	118-119
41	40	118.535	0.98	0.98	0.68	0.67	0.67	5.0	5.0	7.2	4.79	4.96	4.61	15	0.59	391.15	391.85	392.14	392.84	396.65	395.85	119-120
42	13	24.500	0.13	0.13	0.80	0.10	0.10	5.0	5.0	7.2	0.75	5.00	2.86	15	0.60	390.25	390.40	390.58	390.74	394.64	394.64	131-132
43	6	34.412	0.27	0.27	0.35	0.09	0.09	5.0	5.0	7.2	0.68	4.88	2.76	15	0.57	387.55	387.75	387.87	388.07	393.00	392.00	109-110
44	4	24.500	0.09	0.09	0.84	0.08	0.08	5.0	5.0	7.2	0.54	5.05	2.62	15	0.61	385.60	385.75	385.88	386.04	390.03	390.03	106-107

Project File: Storm System 100.stm

Number of lines: 46

Run Date: 11/23/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
45	2	152.566	0.09	0.22	0.81	0.07	0.18	5.0	5.7	7.0	1.22	7.60	1.92	18	0.52	381.20	382.00	382.48	382.41	388.22	386.28	102-103
46	45	24.500	0.13	0.13	0.79	0.10	0.10	5.0	5.0	7.2	0.74	5.05	2.86	15	0.61	382.10	382.25	382.42	382.59	386.28	386.28	103-104

Project File: Storm System 100.stm

Number of lines: 46

Run Date: 11/23/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	54	32.21	380.00	384.13	4.13	5.18	2.11	0.60	384.73	0.000	48.439	380.30	381.93	1.63**	5.18	6.22	0.60	382.53	0.000	0.000	n/a	0.50	0.30
2	36	31.91	380.50	382.21	1.71*	4.15	7.69	0.78	382.98	0.000	24.500	380.65	382.48	1.83**	4.52	7.06	0.78	383.25	0.000	0.000	n/a	2.22	n/a
3	36	30.47	381.15	382.77	1.62*	3.90	7.82	0.75	383.52	0.000	76.900	381.65	383.43	1.79**	4.39	6.94	0.75	384.18	0.000	0.000	n/a	0.57	n/a
4	36	29.89	381.75	383.43	1.69	4.09	7.30	0.74	384.17	0.000	68.369	382.15	383.92	1.77**	4.34	6.89	0.74	384.65	0.000	0.000	n/a	1.48	1.09
5	36	29.59	382.25	383.92	1.67	4.04	7.32	0.73	384.65	0.000	83.524	382.75	384.51	1.76**	4.31	6.87	0.73	385.24	0.000	0.000	n/a	0.50	n/a
6	36	29.63	382.85	384.51	1.66	4.01	7.38	0.73	385.24	0.000	78.768	383.30	385.06	1.76**	4.31	6.87	0.73	385.79	0.000	0.000	n/a	2.19	1.61
7	36	29.05	383.40	385.06	1.66	4.02	7.23	0.72	385.78	0.000	24.500	383.55	385.29	1.74**	4.26	6.82	0.72	386.01	0.000	0.000	n/a	1.47	n/a
8	36	29.16	383.65	385.29	1.64	3.96	7.36	0.72	386.01	0.000	155.766	385.15	386.90	1.75**	4.27	6.83	0.72	387.62	0.000	0.000	n/a	1.50	1.09
9	24	12.38	385.65	386.90	1.25	2.07	5.99	0.54	387.44	0.000	90.492	386.20	387.46	1.26**	2.09	5.92	0.54	388.01	0.000	0.000	n/a	0.50	0.27
10	24	12.51	386.30	387.56	1.26*	2.09	5.99	0.55	388.11	0.000	119.631	387.00	388.27	1.27**	2.10	5.94	0.55	388.82	0.000	0.000	n/a	1.49	0.82
11	24	11.69	387.10	388.30	1.21*	1.98	5.90	0.52	388.82	0.000	111.562	387.75	388.97	1.23**	2.02	5.79	0.52	389.49	0.000	0.000	n/a	1.50	0.78
12	24	11.39	387.85	389.00	1.15*	1.87	6.09	0.51	389.51	0.000	24.500	388.00	389.21	1.21**	1.99	5.73	0.51	389.72	0.000	0.000	n/a	1.13	n/a
13	24	10.42	388.10	389.21	1.11	1.79	5.82	0.48	389.69	0.000	46.317	388.40	389.56	1.16**	1.88	5.54	0.48	390.03	0.000	0.000	n/a	1.13	n/a
14	24	9.51	388.50	389.56	1.06	1.68	5.66	0.45	390.00	0.000	166.000	389.50	390.60	1.10**	1.77	5.36	0.45	391.05	0.000	0.000	n/a	1.50	0.67
15	24	8.72	389.60	390.62	1.02*	1.61	5.43	0.42	391.04	0.000	125.505	390.30	391.35	1.05**	1.68	5.20	0.42	391.77	0.000	0.000	n/a	0.67	0.28
16	24	8.61	390.40	391.44	1.04*	1.65	5.23	0.42	391.86	0.000	78.741	390.80	391.85	1.05**	1.66	5.18	0.42	392.27	0.000	0.000	n/a	0.78	0.33
17	24	7.89	390.90	391.85	0.95	1.46	5.40	0.39	392.24	0.000	62.728	391.30	392.30	1.00**	1.57	5.03	0.39	392.69	0.000	0.000	n/a	1.44	0.57
18	18	7.19	392.00	393.02	1.02*	1.28	5.64	0.47	393.49	0.000	54.500	392.40	393.43	1.04**	1.30	5.52	0.47	393.91	0.000	0.000	n/a	1.86	n/a
19	15	2.84	396.60	397.02	0.42*	0.36	7.94	0.27	397.29	0.000	153.469	401.80	402.48	0.68**	0.68	4.19	0.27	402.75	0.000	0.000	n/a	1.49	n/a
20	15	1.42	402.00	402.48	0.48	0.42	3.23	0.18	402.65	0.000	169.944	403.00	403.48 j	0.47**	0.42	3.36	0.18	403.65	0.000	0.000	n/a	0.50	n/a
21	15	1.46	403.10	403.57	0.46*	0.41	3.55	0.18	403.75	0.000	131.354	403.90	404.38	0.48**	0.43	3.39	0.18	404.56	0.000	0.000	n/a	1.50	n/a
22	15	0.78	404.00	404.38	0.38	0.28	2.50	0.12	404.51	0.000	54.500	404.35	404.70 j	0.35**	0.28	2.83	0.12	404.82	0.000	0.000	n/a	1.00	n/a

Project File: Storm System 100.stm | Number of lines: 46 | Run Date: 11/23/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
23	15	1.01	401.90	402.48	0.58	0.33	1.83	0.14	402.62	0.000	54.497	402.25	402.65 j	0.40**	0.33	3.04	0.14	402.79	0.000	0.000	n/a	1.00	0.14
24	30	20.86	387.00	388.48	1.48*	3.02	6.90	0.66	389.14	0.000	24.511	387.15	388.70	1.55**	3.20	6.52	0.66	389.36	0.000	0.000	n/a	1.09	n/a
25	30	20.76	387.25	388.70	1.45	2.95	7.03	0.66	389.36	0.000	46.478	387.55	389.09	1.55**	3.19	6.51	0.66	389.75	0.000	0.000	n/a	1.15	n/a
26	30	19.55	387.65	389.09	1.45	2.94	6.64	0.63	389.72	0.000	165.333	388.65	390.15	1.50**	3.07	6.36	0.63	390.78	0.000	0.000	n/a	1.50	n/a
27	30	18.48	388.75	390.15	1.40	2.83	6.54	0.60	390.75	0.000	24.500	388.90	390.35	1.46**	2.97	6.23	0.60	390.96	0.000	0.000	n/a	1.43	0.86
28	24	13.00	394.80	395.69	0.89*	1.34	9.67	0.57	396.25	0.000	29.840	395.40	396.70	1.30**	2.15	6.04	0.57	397.26	0.000	0.000	n/a	1.77	n/a
29	18	8.61	395.95	396.88	0.93*	1.16	7.44	0.56	397.44	0.000	71.402	396.90	398.03	1.13**	1.43	6.00	0.56	398.59	0.000	0.000	n/a	0.55	0.31
30	15	2.32	397.20	398.03	0.83	0.59	2.67	0.24	398.27	0.000	58.194	398.90	399.50 j	0.61**	0.59	3.92	0.24	399.74	0.000	0.000	n/a	0.90	n/a
31	15	1.23	399.00	399.50	0.51	0.38	2.63	0.16	399.66	0.000	81.000	400.50	400.94 j	0.44**	0.38	3.22	0.16	401.10	0.000	0.000	n/a	1.00	0.16
32	15	3.87	396.25	396.97	0.72*	0.73	5.33	0.34	397.31	0.000	86.832	397.05	397.84	0.79**	0.82	4.70	0.34	398.19	0.000	0.000	n/a	1.34	0.46
33	15	0.91	397.15	397.84	0.69	0.31	1.29	0.13	397.98	0.000	108.000	399.10	399.47 j	0.37**	0.31	2.94	0.13	399.61	0.000	0.000	n/a	1.00	0.13
34	15	0.72	393.95	394.27	0.32*	0.25	2.89	0.12	394.39	0.000	24.500	394.10	394.43	0.33**	0.26	2.76	0.12	394.55	0.000	0.000	n/a	1.00	0.12
35	15	3.95	392.50	393.43	0.94	0.99	4.00	0.25	393.68	0.451	121.940	393.20	394.01	0.82	0.85	4.66	0.34	394.35	0.648	0.549	0.670	0.95	0.32
36	15	2.59	393.30	394.34	1.04	0.64	2.38	0.26	394.59	0.000	105.290	393.95	394.59	0.64**	0.64	4.06	0.26	394.85	0.000	0.000	n/a	1.00	n/a
37	15	0.58	392.15	392.44	0.29*	0.21	2.72	0.11	392.55	0.000	24.509	392.30	392.60	0.30**	0.22	2.60	0.11	392.70	0.000	0.000	n/a	1.00	n/a
38	15	0.93	391.55	391.92	0.37*	0.30	3.12	0.14	392.06	0.000	24.500	391.70	392.08	0.38**	0.31	2.97	0.14	392.22	0.000	0.000	n/a	1.00	n/a
39	18	5.67	389.90	390.80	0.90*	1.11	5.11	0.39	391.19	0.000	46.711	390.20	391.11	0.92**	1.13	5.00	0.39	391.50	0.000	0.000	n/a	1.41	0.55
40	18	5.67	390.30	391.22	0.93*	1.15	4.93	0.38	391.60	0.588	85.367	390.80	391.73	0.93	1.15	4.93	0.38	392.11	0.587	0.587	0.501	0.50	0.19
41	15	4.79	391.15	392.14	0.99*	1.04	4.61	0.33	392.47	0.590	118.535	391.85	392.84	0.99	1.04	4.61	0.33	393.17	0.592	0.591	0.701	1.00	0.33
42	15	0.75	390.25	390.58	0.33*	0.26	2.92	0.12	390.70	0.000	24.500	390.40	390.74	0.34**	0.27	2.79	0.12	390.86	0.000	0.000	n/a	1.00	n/a
43	15	0.68	387.55	387.87	0.32*	0.24	2.80	0.11	387.98	0.000	34.412	387.75	388.07	0.32**	0.25	2.72	0.11	388.19	0.000	0.000	n/a	1.00	0.11
44	15	0.54	385.60	385.88	0.28*	0.20	2.69	0.10	385.98	0.000	24.500	385.75	386.04	0.29**	0.21	2.55	0.10	386.14	0.000	0.000	n/a	1.00	n/a

Project File: Storm System 100.stm | Number of lines: 46 | Run Date: 11/23/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

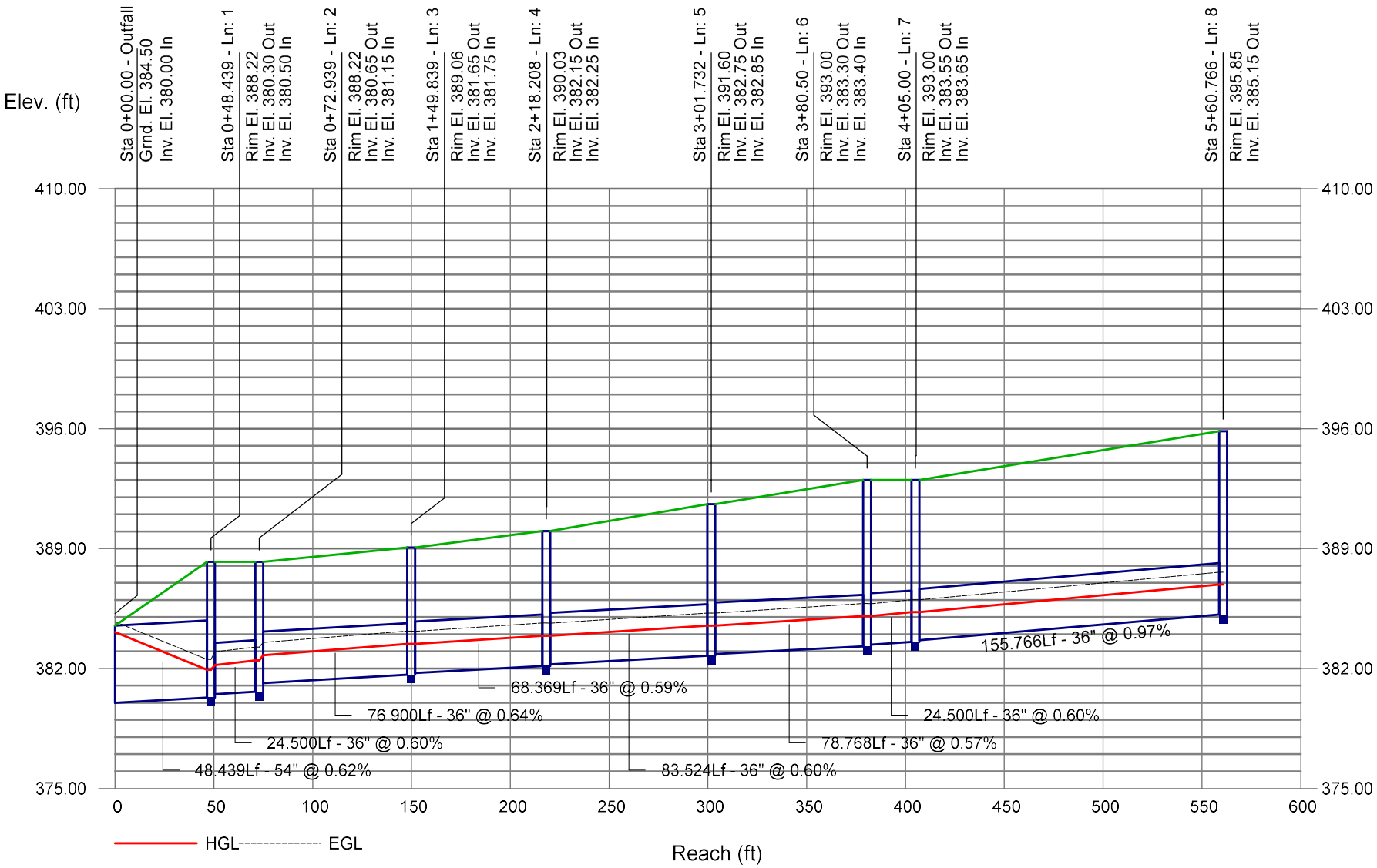
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
45	18	1.22	381.20	382.48	1.28	0.40	0.76	0.15	382.63	0.000	152.566	382.00	382.41	0.41**	0.40	3.09	0.15	382.56	0.000	0.000	n/a	1.50	n/a
46	15	0.74	382.10	382.42	0.32*	0.25	2.94	0.12	382.54	0.000	24.500	382.25	382.59	0.34**	0.27	2.78	0.12	382.71	0.000	0.000	n/a	1.00	0.12

Project File: Storm System 100.stm | Number of lines: 46 | Run Date: 11/23/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

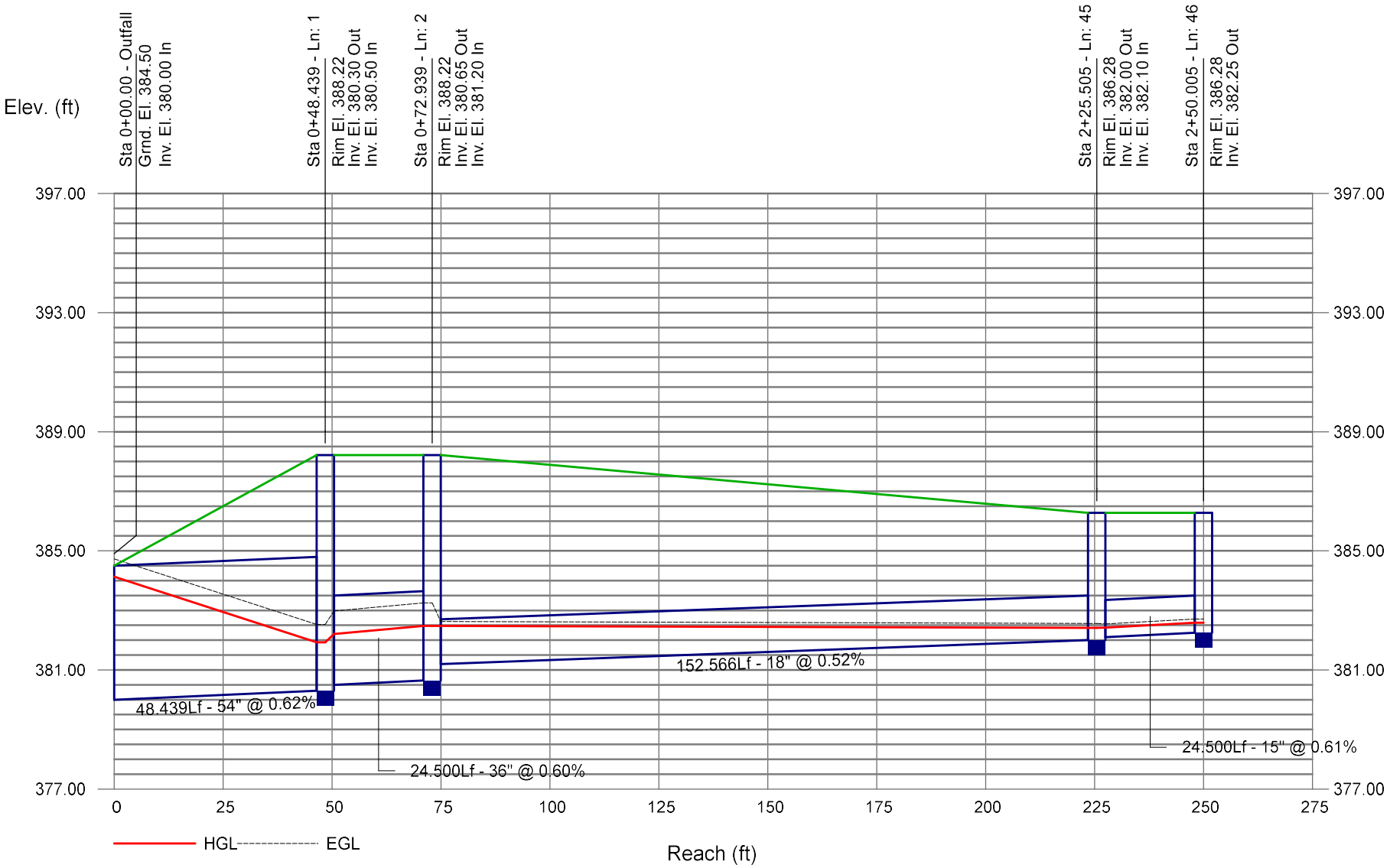
Storm Sewer Profile

Proj. file: Storm System 100.stm



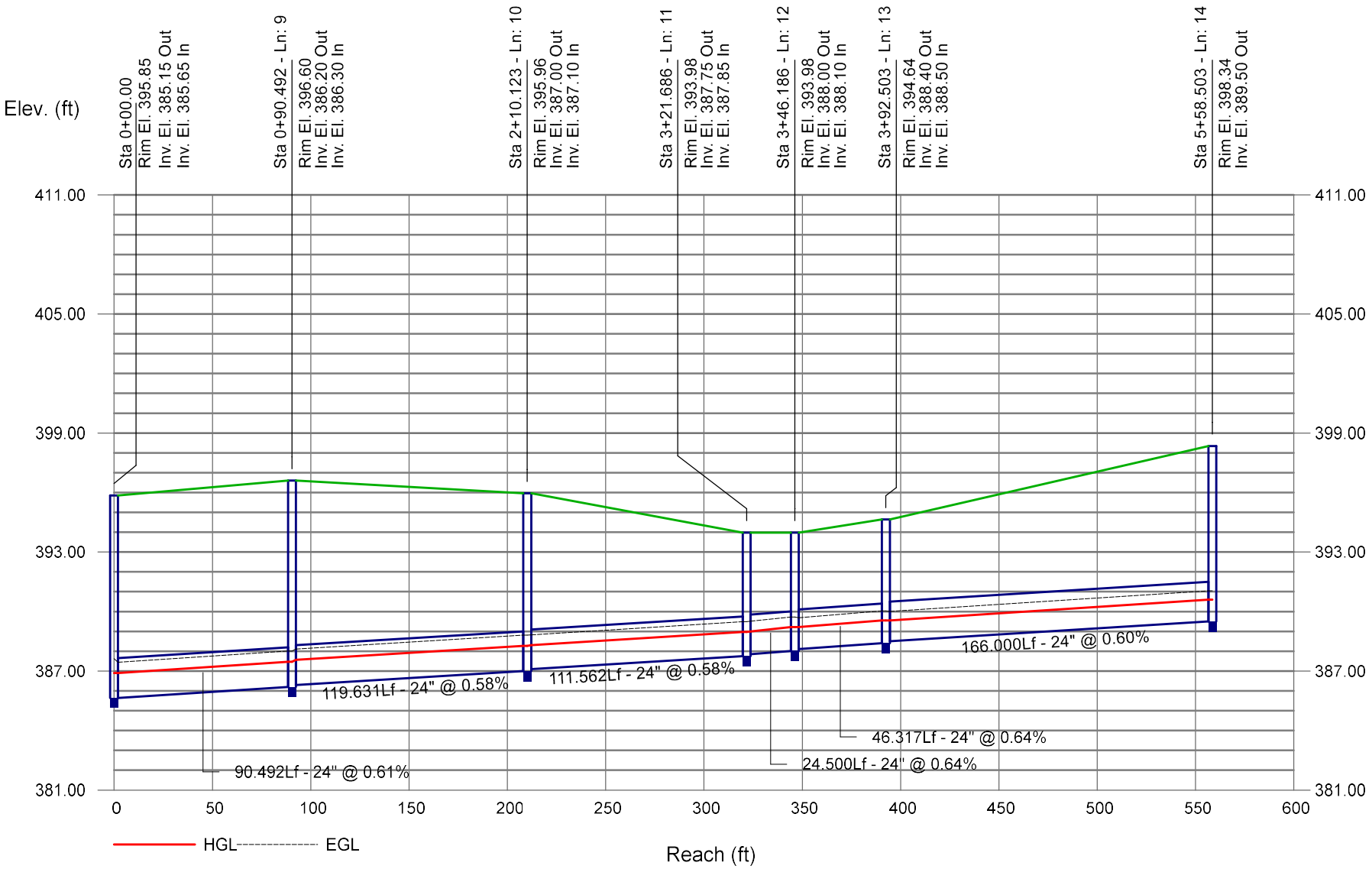
Storm Sewer Profile

Proj. file: Storm System 100.stm



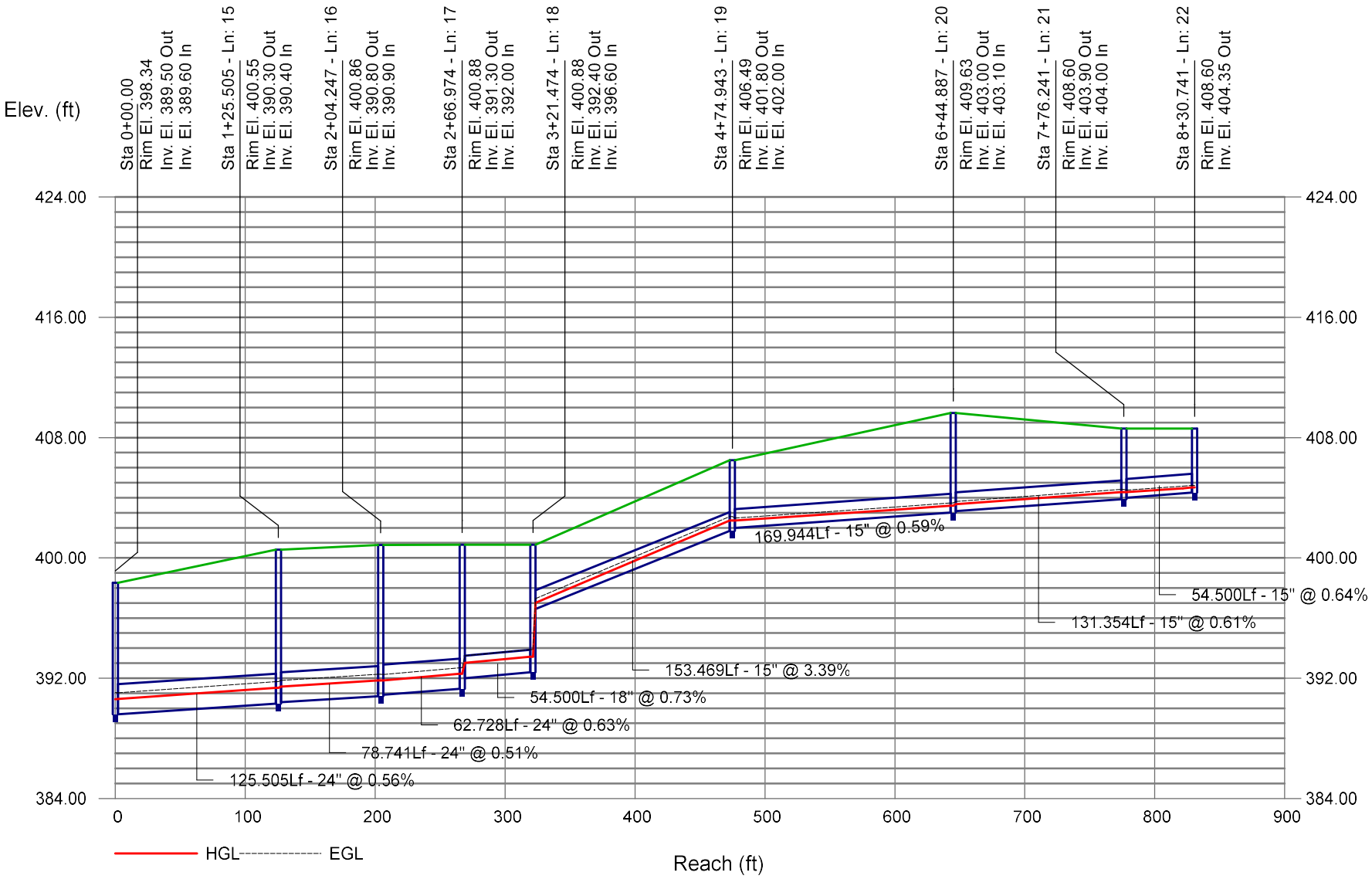
Storm Sewer Profile

Proj. file: Storm System 100.stm



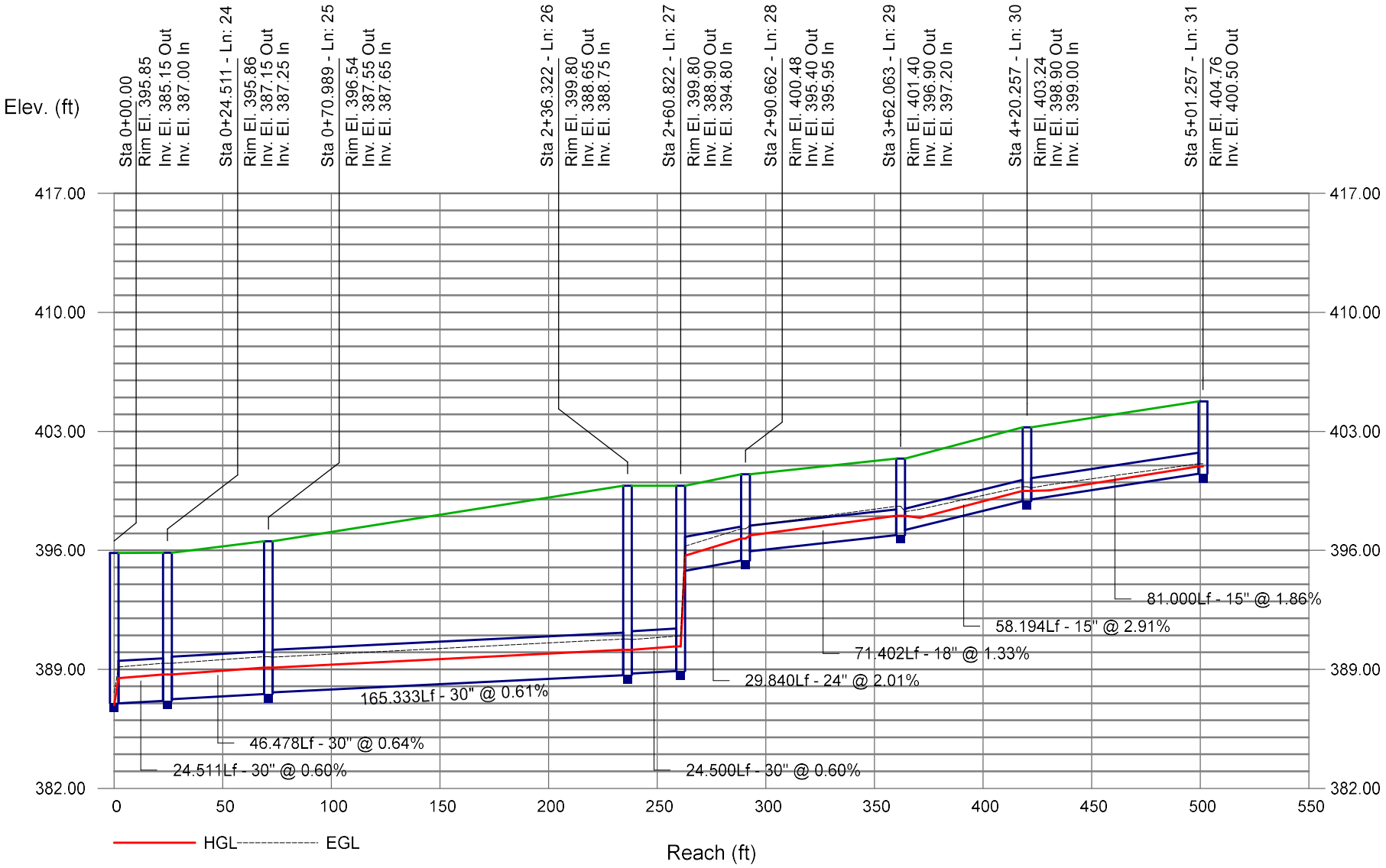
Storm Sewer Profile

Proj. file: Storm System 100.stm



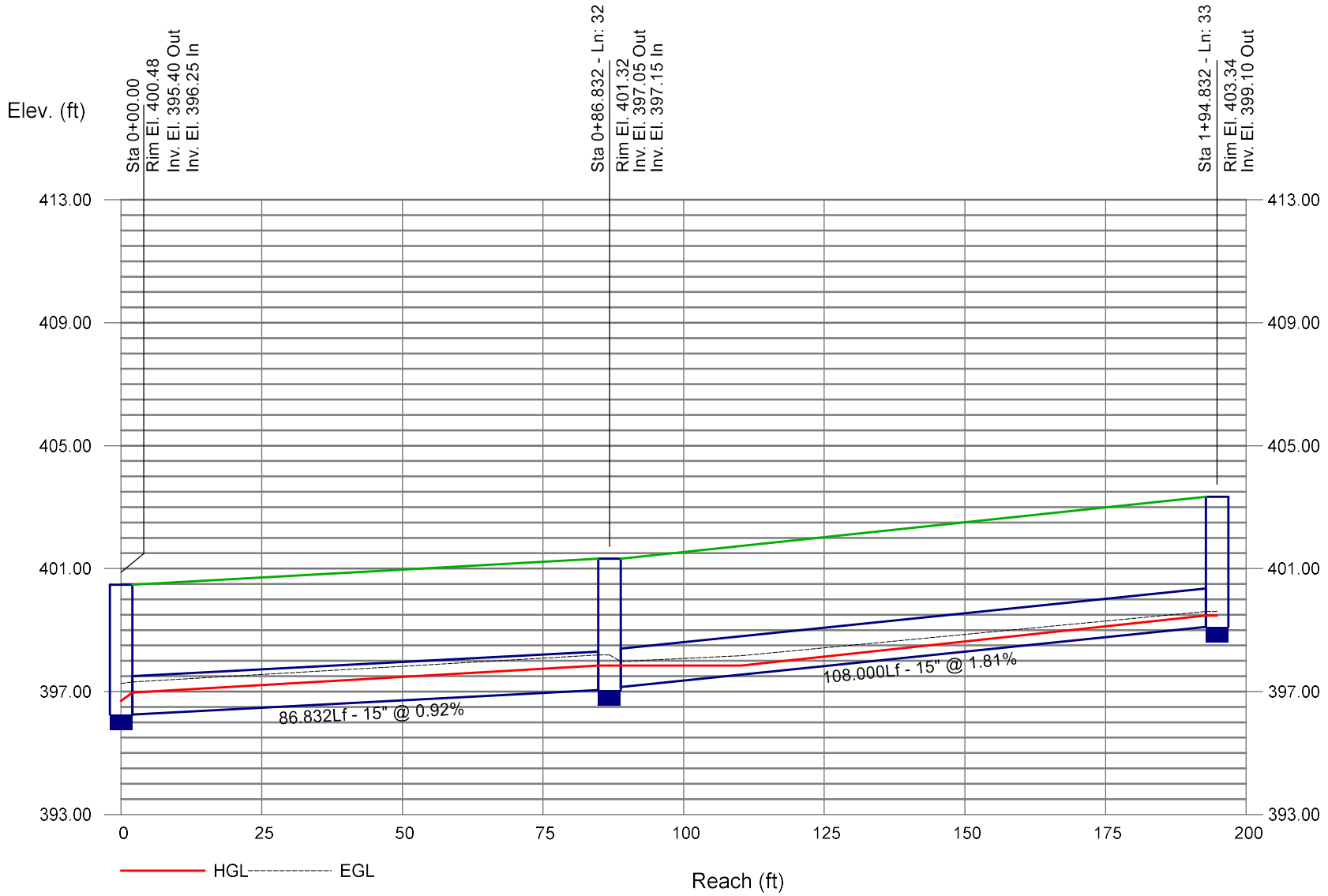
Storm Sewer Profile

Proj. file: Storm System 100.stm



Storm Sewer Profile

Proj. file: Storm System 100.stm



Storm Sewer Profile

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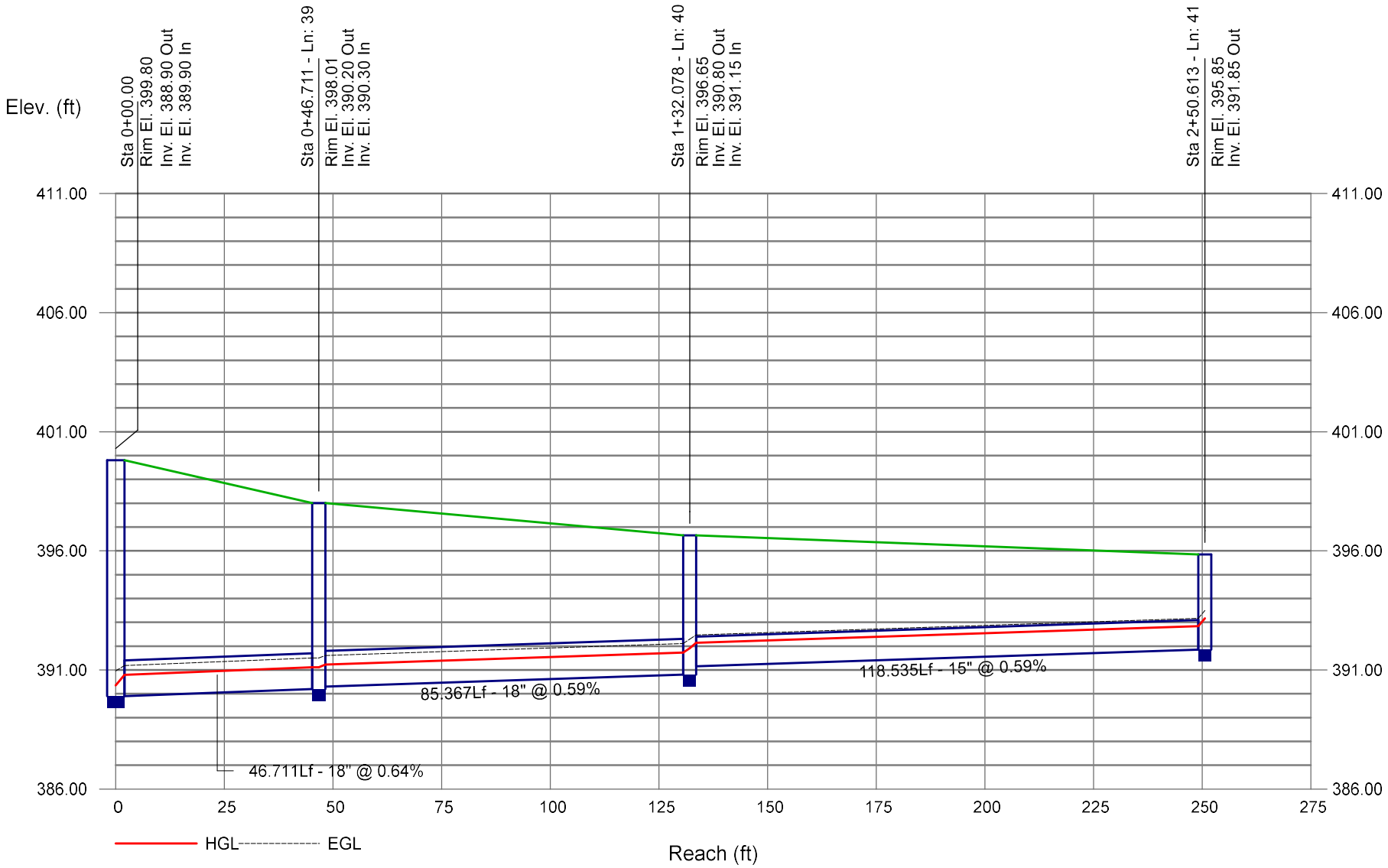
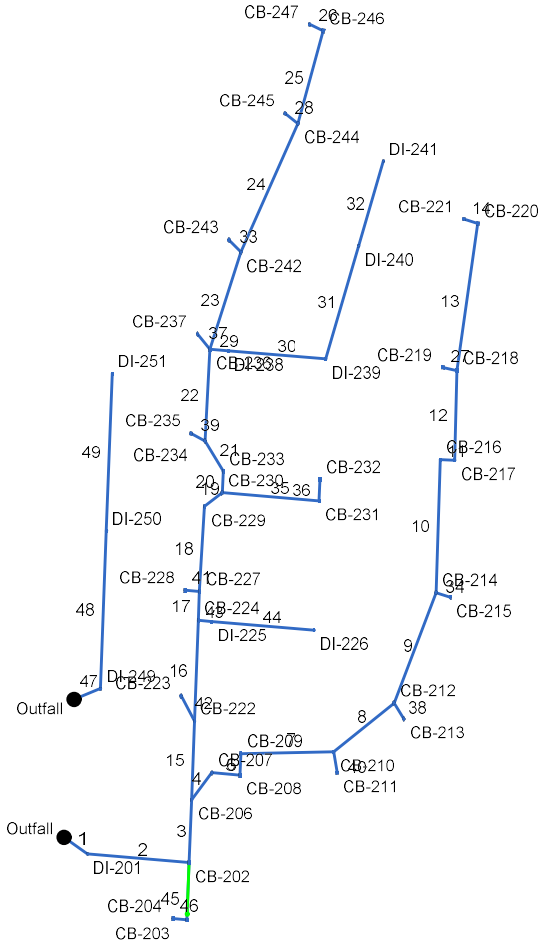


SYSTEM 200 – REPORTS AND PROFILES

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: Storm System 200.stm	Number of lines: 49	Date: 11/23/2020

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	200-201	36.54	42	Cir	43.976	354.10	354.35	0.567	357.53	356.22	n/a	356.22	End	DropGrate
2	201-202	37.19	42	Cir	173.864	354.45	355.35	0.520	356.23	357.24	1.72	357.24	1	Combination
3	202-206	35.39	42	Cir	71.863	355.45	355.85	0.558	357.24	357.70	0.83	357.70	2	Combination
4	206-207	10.46	24	Cir	46.315	359.06	359.33	0.600	360.17	360.49	n/a	360.49	3	Combination
5	207-208	10.16	24	Cir	48.059	359.43	359.72	0.600	360.53	360.86	n/a	360.86	4	Combination
6	208-209	8.86	24	Cir	24.500	359.82	359.97	0.600	360.86	361.03	n/a	361.03	5	Combination
7	209-210	7.74	18	Cir	158.408	360.47	364.56	2.584	361.18	365.64	n/a	365.64	6	Combination
8	210-212	6.64	18	Cir	117.070	364.71	369.37	3.983	365.64	370.37	n/a	370.37	7	Combination
9	212-214	5.63	18	Cir	145.038	369.52	375.36	4.029	370.37	376.28	n/a	376.28	8	Combination
10	214-216	4.65	15	Cir	151.957	375.76	380.88	3.371	376.30	381.76	n/a	381.76	9	Combination
11	216-217	4.25	15	Cir	24.500	380.98	381.13	0.600	381.87	382.02	0.49	382.50	10	Combination
12	217-218	3.92	15	Cir	102.167	381.23	383.90	2.616	382.50	384.70	n/a	384.70 j	11	Combination
13	218-220	2.13	15	Cir	171.701	384.14	388.44	2.506	384.70	389.03	0.34	389.03	12	Combination
14	220-221	1.58	15	Cir	24.500	388.54	388.69	0.600	389.03	389.19	0.19	389.19	13	Combination
15	206-222	25.02	36	Cir	90.000	356.43	356.97	0.600	357.91	358.59	0.69	358.59	3	Combination
16	222-224	24.04	36	Cir	115.000	357.07	357.76	0.600	358.59	359.34	0.95	359.34	15	Combination
17	224-227	20.48	36	Cir	33.142	357.87	358.07	0.600	359.34	359.52	n/a	359.52	16	Combination
18	227-229	19.06	30	Cir	97.495	358.57	359.15	0.600	359.96	360.63	0.81	360.63	17	Combination
19	229-230	18.45	30	Cir	34.033	359.25	359.46	0.600	360.63	360.91	n/a	360.91	18	Combination
20	230-233	15.00	30	Cir	24.500	359.56	359.70	0.600	360.91	361.01	n/a	361.01 j	19	Combination
21	233-234	13.94	30	Cir	46.327	359.80	360.08	0.600	361.01	361.34	0.58	361.34	20	Combination
22	234-236	12.98	24	Cir	105.009	360.58	361.21	0.600	361.86	362.51	n/a	362.51	21	Combination
23	236-242	4.25	15	Cir	122.913	370.81	377.10	5.120	371.27	377.94	0.55	377.94	22	Combination
24	242-244	2.54	15	Cir	176.124	377.35	382.17	2.738	377.94	382.81	n/a	382.81	23	Combination

Project File: Storm System 200.stm | Number of lines: 49 | Run Date: 11/23/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	244-246	1.22	15	Cir	114.007	382.42	386.25	3.362	382.81	386.69	n/a	386.69	24	Combination
26	246-247	0.31	15	Cir	24.500	386.35	386.50	0.600	386.69	386.71	n/a	386.71 j	25	Combination
27	218-219	1.51	15	Cir	24.501	384.00	384.15	0.600	384.70	384.64	0.18	384.64	12	Combination
28	244-245	0.60	15	Cir	24.499	382.27	382.42	0.600	382.81	382.72	0.11	382.72	24	Combination
29	236-238	8.39	24	Cir	31.495	361.71	361.90	0.600	362.69	362.93	n/a	362.93	22	DropGrate
30	238-239	7.62	24	Cir	166.385	362.00	363.00	0.600	362.93	363.98	n/a	363.98	29	DropGrate
31	239-240	3.68	15	Cir	140.774	363.25	377.30	9.979	363.98	378.07	n/a	378.07	30	DropGrate
32	240-241	2.33	15	Cir	105.361	377.50	379.75	2.136	378.07	380.36	n/a	380.36	31	DropGrate
33	242-243	0.71	15	Cir	24.500	377.20	377.35	0.600	377.94	377.68	n/a	377.68	23	Combination
34	214-215	0.54	15	Cir	24.503	375.61	375.76	0.600	376.28	376.05	n/a	376.05	9	Combination
35	230-231	2.82	15	Cir	165.104	366.83	372.34	3.339	367.25	373.02	0.41	373.02	19	Combination
36	231-232	1.51	15	Cir	24.500	372.44	372.59	0.600	373.02	373.08	n/a	373.08 j	35	Combination
37	236-237	0.57	15	Cir	27.486	372.41	372.94	1.928	372.62	373.23	n/a	373.23	22	Combination
38	212-213	0.54	15	Cir	24.499	369.62	369.77	0.600	370.37	370.06	n/a	370.06	8	Combination
39	234-235	1.07	15	Cir	25.606	367.98	368.25	1.054	368.32	368.66	0.15	368.66	21	Combination
40	210-211	0.94	15	Cir	24.499	364.81	364.96	0.600	365.64	365.34	0.14	365.34	7	Combination
41	227-228	1.56	15	Cir	24.500	363.86	364.01	0.600	364.34	364.51	0.19	364.51	17	Combination
42	222-223	1.15	15	Cir	36.980	362.10	362.50	1.082	362.45	362.92	n/a	362.92	15	Combination
43	224-225	4.13	15	Cir	22.701	359.51	359.65	0.600	360.38	360.52	0.16	360.68	16	DropGrate
44	225-226	1.54	15	Cir	175.049	359.75	365.75	3.428	360.68	366.24	n/a	366.24 j	43	DropGrate
45	202-203	2.38	15	Cir	65.441	358.30	358.70	0.615	358.90	359.32	n/a	359.32	2	Combination
46	203-204	2.16	15	Cir	24.500	358.80	358.95	0.600	359.38	359.54	0.23	359.54	45	Combination
47	248-249	4.01	24	Cir	46.634	354.00	356.15	4.610	357.53	357.53	0.07	357.59	End	DropGrate
48	249-250	2.42	15	Cir	180.000	356.95	358.25	0.722	357.59	358.87	n/a	358.87 j	47	DropGrate

Project File: Storm System 200.stm | Number of lines: 49 | Run Date: 11/23/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
49	250-251	1.21	15	Cir	180.000	358.35	364.25	3.278	358.87	364.68	n/a	364.68 j	48	DropGrate

Project File: Storm System 200.stm | Number of lines: 49 | Run Date: 11/23/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	43.976	0.05	10.61	0.65	0.03	7.03	5.0	13.6	5.2	36.54	75.76	5.39	42	0.57	354.10	354.35	357.53	356.22	358.60	362.00	200-201
2	1	173.864	0.09	10.56	0.75	0.07	7.00	5.0	12.9	5.3	37.19	72.53	7.30	42	0.52	354.45	355.35	356.23	357.24	362.00	364.33	201-202
3	2	71.863	0.24	10.00	0.74	0.18	6.60	5.0	12.6	5.4	35.39	75.16	7.02	42	0.56	355.45	355.85	357.24	357.70	364.33	365.31	202-206
4	3	46.315	0.10	2.55	0.68	0.07	1.82	5.0	10.5	5.8	10.46	17.52	5.69	24	0.60	359.06	359.33	360.17	360.49	365.31	365.26	206-207
5	4	48.059	0.35	2.45	0.66	0.23	1.75	5.0	10.2	5.8	10.16	17.52	5.64	24	0.60	359.43	359.72	360.53	360.86	365.26	364.97	207-208
6	5	24.500	0.36	2.10	0.61	0.22	1.52	5.0	10.1	5.8	8.86	17.52	5.30	24	0.60	359.82	359.97	360.86	361.03	364.97	364.97	208-209
7	6	158.408	0.10	1.74	0.75	0.08	1.30	5.0	9.5	6.0	7.74	16.88	7.52	18	2.58	360.47	364.56	361.18	365.64	364.97	369.21	209-210
8	7	117.070	0.17	1.46	0.68	0.12	1.09	5.0	9.0	6.1	6.64	20.96	5.55	18	3.98	364.71	369.37	365.64	370.37	369.21	374.02	210-212
9	8	145.038	0.13	1.20	0.77	0.10	0.90	5.0	8.2	6.3	5.63	21.08	5.22	18	4.03	369.52	375.36	370.37	376.28	374.02	380.01	212-214
10	9	151.957	0.08	0.98	0.81	0.06	0.72	5.0	7.6	6.4	4.65	11.86	7.08	15	3.37	375.76	380.88	376.30	381.76	380.01	385.48	214-216
11	10	24.500	0.08	0.90	0.81	0.06	0.66	5.0	7.5	6.5	4.25	5.00	4.57	15	0.60	380.98	381.13	381.87	382.02	385.48	385.48	216-217
12	11	102.167	0.10	0.82	0.82	0.08	0.59	5.0	6.9	6.6	3.92	10.44	3.96	15	2.62	381.23	383.90	382.50	384.70	385.48	388.39	217-218
13	12	171.701	0.10	0.41	0.81	0.08	0.30	5.0	5.3	7.1	2.13	10.22	3.89	15	2.51	384.14	388.44	384.70	389.03	388.39	392.94	218-220
14	13	24.500	0.31	0.31	0.71	0.22	0.22	5.0	5.0	7.2	1.58	5.00	3.54	15	0.60	388.54	388.69	389.03	389.19	392.94	392.94	220-221
15	3	90.000	0.13	7.21	0.74	0.10	4.61	5.0	12.2	5.4	25.02	51.66	6.86	36	0.60	356.43	356.97	357.91	358.59	365.31	366.42	206-222
16	15	115.000	0.04	6.86	0.71	0.03	4.35	5.0	11.7	5.5	24.04	51.66	6.55	36	0.60	357.07	357.76	358.59	359.34	366.42	367.85	222-224
17	16	33.142	0.11	5.77	0.75	0.08	3.68	5.0	11.5	5.6	20.48	51.66	5.99	36	0.60	357.87	358.07	359.34	359.52	367.85	368.26	224-227
18	17	97.495	0.16	5.34	0.77	0.12	3.38	5.0	11.1	5.6	19.06	31.77	6.53	30	0.60	358.57	359.15	359.96	360.63	368.26	369.77	227-229
19	18	34.033	0.31	5.18	0.72	0.22	3.26	5.0	11.0	5.7	18.45	31.77	6.44	30	0.60	359.25	359.46	360.63	360.91	369.77	371.08	229-230
20	19	24.500	0.30	4.30	0.69	0.21	2.64	5.0	10.9	5.7	15.00	31.77	5.66	30	0.60	359.56	359.70	360.91	361.01	371.08	371.08	230-233
21	20	46.327	0.06	4.00	0.82	0.05	2.43	5.0	10.6	5.7	13.94	31.77	5.80	30	0.60	359.80	360.08	361.01	361.34	371.08	372.23	233-234
22	21	105.009	0.16	3.73	0.74	0.12	2.23	5.0	10.2	5.8	12.98	17.52	6.07	24	0.60	360.58	361.21	361.86	362.51	372.23	376.66	234-236

Project File: Storm System 200.stm

Number of lines: 49

Run Date: 11/23/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	22	122.913	0.32	0.98	0.66	0.21	0.72	5.0	9.7	5.9	4.25	14.61	7.60	15	5.12	370.81	377.10	371.27	377.94	376.66	381.60	236-242
24	23	176.124	0.21	0.54	0.68	0.14	0.41	5.0	8.4	6.2	2.54	10.69	4.25	15	2.74	377.35	382.17	377.94	382.81	381.60	386.67	242-244
25	24	114.007	0.17	0.22	0.82	0.14	0.18	5.0	6.6	6.7	1.22	11.84	3.46	15	3.36	382.42	386.25	382.81	386.69	386.67	390.75	244-246
26	25	24.500	0.05	0.05	0.85	0.04	0.04	5.0	5.0	7.2	0.31	5.00	1.67	15	0.60	386.35	386.50	386.69	386.71	390.75	390.75	246-247
27	12	24.501	0.31	0.31	0.68	0.21	0.21	5.0	5.0	7.2	1.51	5.00	2.78	15	0.60	384.00	384.15	384.70	384.64	388.39	388.40	218-219
28	24	24.499	0.11	0.11	0.76	0.08	0.08	5.0	5.0	7.2	0.60	5.00	1.91	15	0.60	382.27	382.42	382.81	382.72	386.67	386.67	244-245
29	22	31.495	0.30	2.48	0.58	0.17	1.32	5.0	7.8	6.4	8.39	17.52	5.32	24	0.60	361.71	361.90	362.69	362.93	376.66	374.00	236-238
30	29	166.385	1.22	2.18	0.50	0.61	1.14	5.0	6.7	6.7	7.62	17.52	5.15	24	0.60	362.00	363.00	362.93	363.98	374.00	367.50	238-239
31	30	140.774	0.38	0.96	0.55	0.21	0.53	5.0	5.9	6.9	3.68	20.40	4.77	15	9.98	363.25	377.30	363.98	378.07	367.50	381.75	239-240
32	31	105.361	0.58	0.58	0.56	0.32	0.32	5.0	5.0	7.2	2.33	9.44	4.09	15	2.14	377.50	379.75	378.07	380.36	381.75	384.00	240-241
33	23	24.500	0.12	0.12	0.82	0.10	0.10	5.0	5.0	7.2	0.71	5.00	1.85	15	0.60	377.20	377.35	377.94	377.68	381.60	381.60	242-243
34	9	24.503	0.09	0.09	0.84	0.08	0.08	5.0	5.0	7.2	0.54	5.00	1.69	15	0.60	375.61	375.76	376.28	376.05	380.01	380.01	214-215
35	19	165.104	0.27	0.57	0.70	0.19	0.40	5.0	5.3	7.1	2.82	11.80	6.04	15	3.34	366.83	372.34	367.25	373.02	371.08	376.84	230-231
36	35	24.500	0.30	0.30	0.70	0.21	0.21	5.0	5.0	7.2	1.51	5.00	3.08	15	0.60	372.44	372.59	373.02	373.08	376.84	376.84	231-232
37	22	27.486	0.11	0.11	0.72	0.08	0.08	5.0	5.0	7.2	0.57	8.97	3.33	15	1.93	372.41	372.94	372.62	373.23	376.66	377.19	236-237
38	8	24.499	0.09	0.09	0.84	0.08	0.08	5.0	5.0	7.2	0.54	5.00	1.63	15	0.60	369.62	369.77	370.37	370.06	374.02	374.02	212-213
39	21	25.606	0.21	0.21	0.71	0.15	0.15	5.0	5.0	7.2	1.07	6.63	3.53	15	1.05	367.98	368.25	368.32	368.66	372.23	372.50	234-235
40	7	24.499	0.18	0.18	0.73	0.13	0.13	5.0	5.0	7.2	0.94	5.00	2.04	15	0.60	364.81	364.96	365.64	365.34	369.21	369.21	210-211
41	17	24.500	0.32	0.32	0.68	0.22	0.22	5.0	5.0	7.2	1.56	5.00	3.53	15	0.60	363.86	364.01	364.34	364.51	368.26	368.26	227-228
42	15	36.980	0.22	0.22	0.73	0.16	0.16	5.0	5.0	7.2	1.15	6.72	3.62	15	1.08	362.10	362.50	362.45	362.92	366.42	366.77	222-223
43	16	22.701	0.68	1.05	0.62	0.42	0.64	5.0	7.3	6.5	4.13	5.00	4.55	15	0.60	359.51	359.65	360.38	360.52	367.85	364.00	224-225
44	43	175.049	0.37	0.37	0.58	0.21	0.21	5.0	5.0	7.2	1.54	11.96	2.51	15	3.43	359.75	365.75	360.68	366.24	364.00	370.00	225-226

Project File: Storm System 200.stm | Number of lines: 49 | Run Date: 11/23/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
45	2	65.441	0.04	0.47	0.85	0.03	0.34	5.0	5.2	7.1	2.38	5.07	4.01	15	0.62	358.30	358.70	358.90	359.32	364.33	363.22	202-203
46	45	24.500	0.43	0.43	0.70	0.30	0.30	5.0	5.0	7.2	2.16	5.00	3.88	15	0.60	358.80	358.95	359.38	359.54	363.22	363.22	203-204
47	End	46.634	0.44	1.03	0.65	0.29	0.67	5.0	9.4	6.0	4.01	48.56	1.51	24	4.61	354.00	356.15	357.53	357.53	356.33	360.00	248-249
48	47	180.000	0.33	0.59	0.65	0.21	0.38	5.0	8.0	6.3	2.42	5.49	3.88	15	0.72	356.95	358.25	357.59	358.87	360.00	362.00	249-250
49	48	180.000	0.26	0.26	0.65	0.17	0.17	5.0	5.0	7.2	1.21	11.69	2.85	15	3.28	358.35	364.25	358.87	364.68	362.00	368.00	250-251

Project File: Storm System 200.stm | Number of lines: 49 | Run Date: 11/23/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	42	36.54	354.10	357.53	3.43	5.25	3.82	0.75	358.28	0.000	43.976	354.35	356.22	1.87**	5.25	6.97	0.75	356.98	0.000	0.000	n/a	0.65	n/a
2	42	37.19	354.45	356.23	1.78*	4.90	7.58	0.76	356.99	0.000	173.864	355.35	357.24	1.89**	5.31	7.01	0.76	358.01	0.000	0.000	n/a	2.25	1.72
3	42	35.39	355.45	357.24	1.79	4.96	7.14	0.74	357.98	0.000	71.863	355.85	357.70	1.84**	5.14	6.89	0.74	358.44	0.000	0.000	n/a	1.13	0.83
4	24	10.46	359.06	360.17	1.11*	1.80	5.82	0.48	360.65	0.000	46.315	359.33	360.49	1.16**	1.88	5.55	0.48	360.97	0.000	0.000	n/a	1.13	n/a
5	24	10.16	359.43	360.53	1.09*	1.76	5.78	0.47	361.00	0.000	48.059	359.72	360.86	1.14**	1.85	5.49	0.47	361.33	0.000	0.000	n/a	1.50	n/a
6	24	8.86	359.82	360.86	1.04	1.65	5.37	0.43	361.29	0.000	24.500	359.97	361.03	1.06**	1.69	5.23	0.43	361.46	0.000	0.000	n/a	1.50	n/a
7	18	7.74	360.47	361.18	0.71*	0.83	9.35	0.51	361.69	0.000	158.408	364.56	365.64	1.08**	1.36	5.70	0.51	366.15	0.000	0.000	n/a	1.47	n/a
8	18	6.64	364.71	365.64	0.93	1.15	5.76	0.44	366.08	0.000	117.070	369.37	370.37	1.00**	1.25	5.33	0.44	370.81	0.000	0.000	n/a	1.46	n/a
9	18	5.63	369.52	370.37	0.85	1.03	5.46	0.39	370.76	0.000	145.038	375.36	376.28	0.91**	1.13	4.99	0.39	376.66	0.000	0.000	n/a	1.44	n/a
10	15	4.65	375.76	376.30	0.54*	0.51	9.07	0.40	376.70	0.000	151.957	380.88	381.76	0.87**	0.92	5.08	0.40	382.16	0.000	0.000	n/a	1.50	n/a
11	15	4.25	380.98	381.87	0.89*	0.93	4.57	0.33	382.19	0.600	24.500	381.13	382.02	0.89	0.93	4.57	0.32	382.34	0.598	0.599	0.147	1.50	0.49
12	15	3.92	381.23	382.50	1.25	0.83	3.19	0.16	382.66	0.368	102.167	383.90	384.70 j	0.80**	0.83	4.72	0.35	385.05	0.673	0.521	n/a	1.49	0.52
13	15	2.13	384.14	384.70	0.56	0.54	3.98	0.23	384.93	0.000	171.701	388.44	389.03	0.58**	0.56	3.81	0.23	389.25	0.000	0.000	n/a	1.50	0.34
14	15	1.58	388.54	389.03	0.48*	0.44	3.61	0.19	389.21	0.000	24.500	388.69	389.19	0.50**	0.46	3.47	0.19	389.38	0.000	0.000	n/a	1.00	0.19
15	36	25.02	356.43	357.91	1.47*	3.45	7.25	0.65	358.56	0.000	90.000	356.97	358.59	1.61**	3.87	6.46	0.65	359.24	0.000	0.000	n/a	1.06	0.69
16	36	24.04	357.07	358.59	1.51	3.57	6.73	0.63	359.22	0.000	115.000	357.76	359.34	1.58**	3.77	6.37	0.63	359.97	0.000	0.000	n/a	1.50	0.95
17	36	20.48	357.87	359.34	1.47	3.39	5.93	0.57	359.91	0.000	33.142	358.07	359.52	1.45**	3.39	6.04	0.57	360.09	0.000	0.000	n/a	1.50	n/a
18	30	19.06	358.57	359.96	1.40*	2.82	6.76	0.62	360.58	0.000	97.495	359.15	360.63	1.48**	3.02	6.30	0.62	361.25	0.000	0.000	n/a	1.31	0.81
19	30	18.45	359.25	360.63	1.38	2.78	6.65	0.60	361.24	0.000	34.033	359.46	360.91	1.45**	2.96	6.23	0.60	361.52	0.000	0.000	n/a	1.89	n/a
20	30	15.00	359.56	360.91	1.35	2.59	5.52	0.52	361.43	0.000	24.500	359.70	361.01 j	1.30**	2.59	5.79	0.52	361.53	0.000	0.000	n/a	1.13	n/a
21	30	13.94	359.80	361.01	1.20	2.34	5.95	0.50	361.50	0.000	46.327	360.08	361.34	1.26**	2.47	5.65	0.50	361.83	0.000	0.000	n/a	1.18	0.58
22	24	12.98	360.58	361.86	1.28*	2.13	6.10	0.57	362.43	0.000	105.009	361.21	362.51	1.29**	2.15	6.03	0.57	363.07	0.000	0.000	n/a	1.91	n/a

Project File: Storm System 200.stm | Number of lines: 49 | Run Date: 11/23/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
23	15	4.25	370.81	371.27	0.46*	0.41	10.31	0.37	371.64	0.000	122.913	377.10	377.94	0.83**	0.87	4.88	0.37	378.31	0.000	0.000	n/a	1.48	0.55
24	15	2.54	377.35	377.94	0.59	0.57	4.48	0.25	378.19	0.000	176.124	382.17	382.81	0.64**	0.63	4.03	0.25	383.06	0.000	0.000	n/a	1.50	n/a
25	15	1.22	382.42	382.81	0.39	0.33	3.71	0.16	382.97	0.000	114.007	386.25	386.69	0.43**	0.38	3.21	0.16	386.85	0.000	0.000	n/a	1.50	n/a
26	15	0.31	386.35	386.69	0.33	0.14	1.16	0.07	386.76	0.000	24.500	386.50	386.71 j	0.21**	0.14	2.19	0.07	386.79	0.000	0.000	n/a	1.00	0.07
27	15	1.51	384.00	384.70	0.70	0.44	2.14	0.18	384.88	0.000	24.501	384.15	384.64	0.49**	0.44	3.42	0.18	384.82	0.000	0.000	n/a	1.00	0.18
28	15	0.60	382.27	382.81	0.54	0.23	1.19	0.11	382.92	0.000	24.499	382.42	382.72	0.30**	0.23	2.63	0.11	382.83	0.000	0.000	n/a	1.00	0.11
29	24	8.39	361.71	362.69	0.98*	1.52	5.51	0.41	363.10	0.000	31.495	361.90	362.93	1.03**	1.63	5.14	0.41	363.34	0.000	0.000	n/a	0.50	n/a
30	24	7.62	362.00	362.93	0.93	1.43	5.32	0.38	363.32	0.000	166.385	363.00	363.98	0.98**	1.53	4.98	0.38	364.37	0.000	0.000	n/a	1.42	n/a
31	15	3.68	363.25	363.98	0.73	0.75	4.94	0.33	364.31	0.000	140.774	377.30	378.07	0.77**	0.80	4.61	0.33	378.40	0.000	0.000	n/a	0.50	n/a
32	15	2.33	377.50	378.07	0.57	0.55	4.27	0.24	378.31	0.000	105.361	379.75	380.36	0.61**	0.60	3.92	0.24	380.60	0.000	0.000	n/a	1.00	n/a
33	15	0.71	377.20	377.94	0.73	0.26	0.94	0.12	378.05	0.000	24.500	377.35	377.68	0.33**	0.26	2.75	0.12	377.80	0.000	0.000	n/a	1.00	n/a
34	15	0.54	375.61	376.28	0.66	0.21	0.82	0.10	376.38	0.000	24.503	375.76	376.05	0.29**	0.21	2.55	0.10	376.15	0.000	0.000	n/a	1.00	n/a
35	15	2.82	366.83	367.25	0.42*	0.36	7.89	0.27	367.52	0.000	165.104	372.34	373.02	0.67**	0.68	4.18	0.27	373.29	0.000	0.000	n/a	1.50	0.41
36	15	1.51	372.44	373.02	0.57	0.44	2.74	0.18	373.20	0.000	24.500	372.59	373.08 j	0.49**	0.44	3.42	0.18	373.26	0.000	0.000	n/a	1.00	0.18
37	15	0.57	372.41	372.62	0.21*	0.14	4.08	0.10	372.73	0.000	27.486	372.94	373.23	0.29**	0.22	2.59	0.10	373.34	0.000	0.000	n/a	1.00	n/a
38	15	0.54	369.62	370.37	0.75	0.21	0.71	0.10	370.47	0.000	24.499	369.77	370.06	0.29**	0.21	2.55	0.10	370.16	0.000	0.000	n/a	1.00	n/a
39	15	1.07	367.98	368.32	0.34*	0.27	3.97	0.15	368.47	0.000	25.606	368.25	368.66	0.41**	0.35	3.09	0.15	368.81	0.000	0.000	n/a	1.00	0.15
40	15	0.94	364.81	365.64	0.83	0.32	1.10	0.14	365.78	0.000	24.499	364.96	365.34	0.38**	0.32	2.98	0.14	365.48	0.000	0.000	n/a	1.00	0.14
41	15	1.56	363.86	364.34	0.48*	0.43	3.60	0.19	364.53	0.000	24.500	364.01	364.51	0.50**	0.45	3.46	0.19	364.69	0.000	0.000	n/a	1.00	0.19
42	15	1.15	362.10	362.45	0.35*	0.28	4.09	0.16	362.61	0.000	36.980	362.50	362.92	0.42**	0.37	3.16	0.16	363.08	0.000	0.000	n/a	1.00	n/a
43	15	4.13	359.51	360.38	0.87*	0.91	4.55	0.32	360.70	0.600	22.701	359.65	360.52	0.87	0.91	4.55	0.32	360.84	0.600	0.600	0.136	0.50	0.16
44	15	1.54	359.75	360.68	0.93	0.45	1.58	0.18	360.86	0.000	175.049	365.75	366.24 j	0.49**	0.45	3.44	0.18	366.43	0.000	0.000	n/a	1.00	0.18

Project File: Storm System 200.stm | Number of lines: 49 | Run Date: 11/23/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

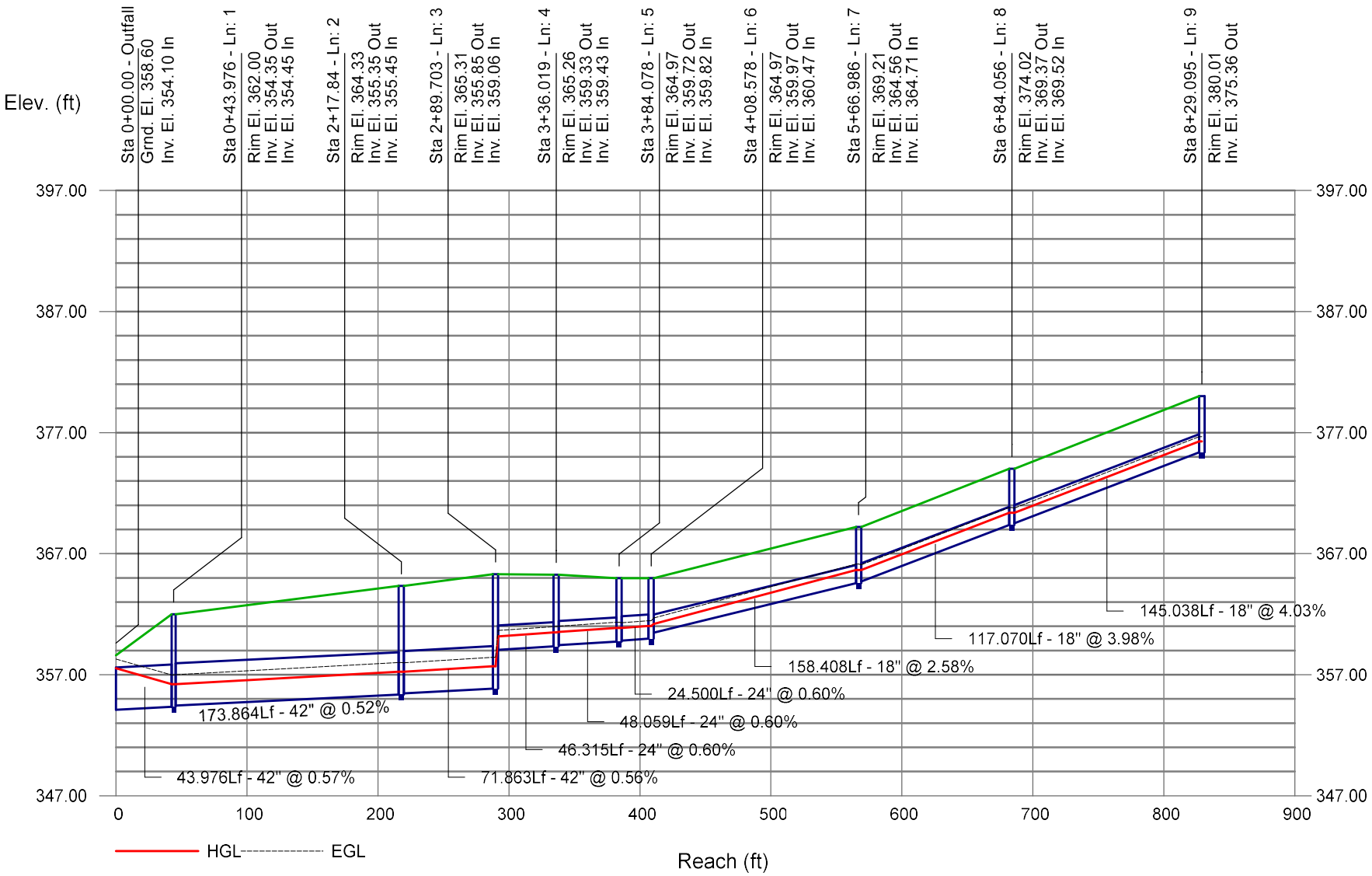
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
45	15	2.38	358.30	358.90	0.60*	0.59	4.06	0.24	359.15	0.000	65.441	358.70	359.32	0.62**	0.60	3.95	0.24	359.56	0.000	0.000	n/a	1.50	n/a
46	15	2.16	358.80	359.38	0.57*	0.55	3.93	0.23	359.61	0.000	24.500	358.95	359.54	0.59**	0.57	3.83	0.23	359.76	0.000	0.000	n/a	1.00	0.23
47	24	4.01	354.00	357.53	2.00	3.14	1.28	0.03	357.56	0.031	46.634	356.15	357.53	1.38	2.31	1.74	0.05	357.57	0.047	0.039	0.018	1.43	0.07
48	15	2.42	356.95	357.59	0.64	0.61	3.80	0.24	357.84	0.000	180.000	358.25	358.87 j	0.62**	0.61	3.97	0.24	359.12	0.000	0.000	n/a	0.50	n/a
49	15	1.21	358.35	358.87	0.52	0.38	2.50	0.16	359.03	0.000	180.000	364.25	364.68 j	0.43**	0.38	3.21	0.16	364.84	0.000	0.000	n/a	1.00	0.16

Project File: Storm System 200.stm | Number of lines: 49 | Run Date: 11/23/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

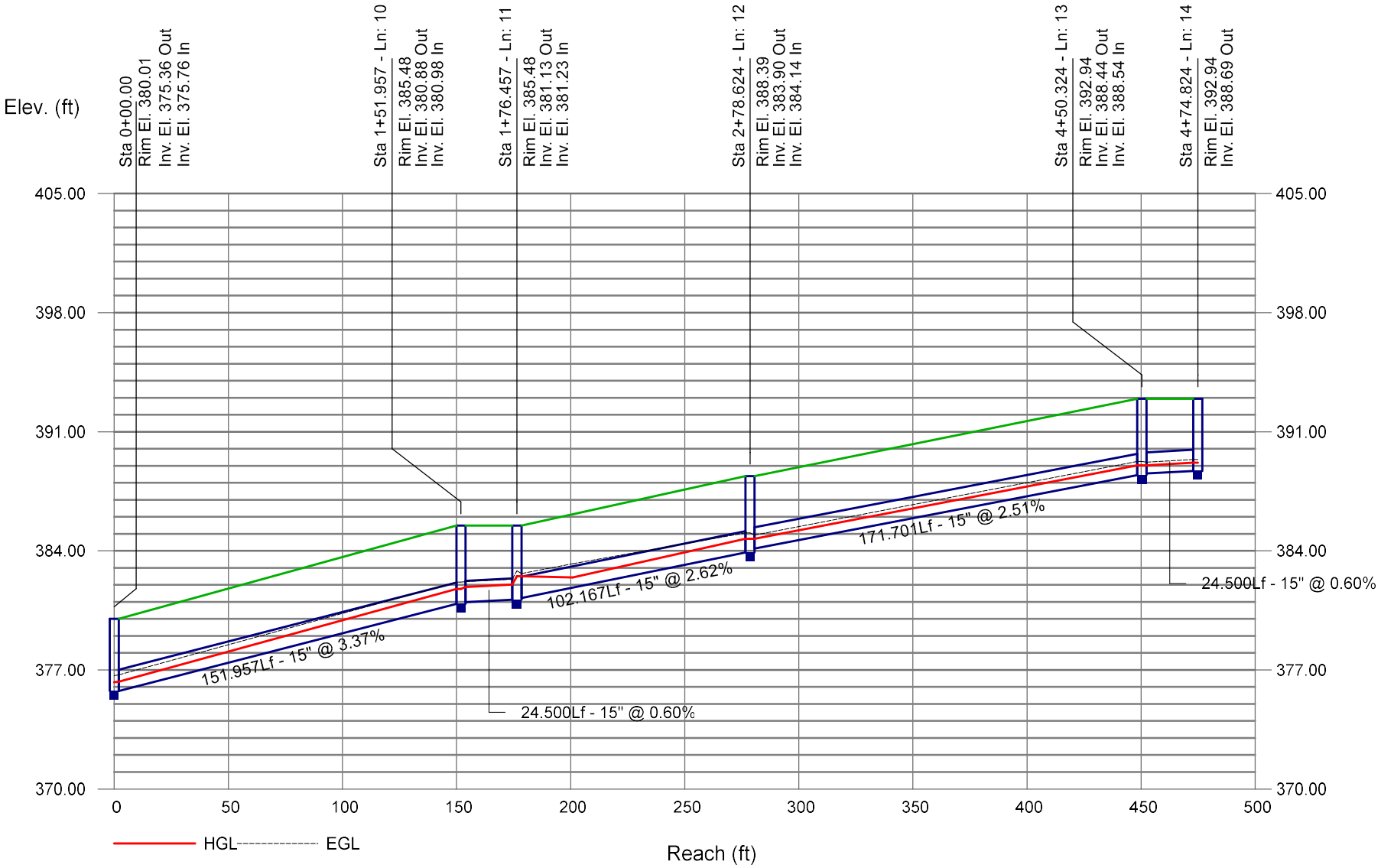
Storm Sewer Profile

Proj. file: Storm System 200.stm



Storm Sewer Profile

Proj. file: Storm System 200.stm



Storm Sewer Profile

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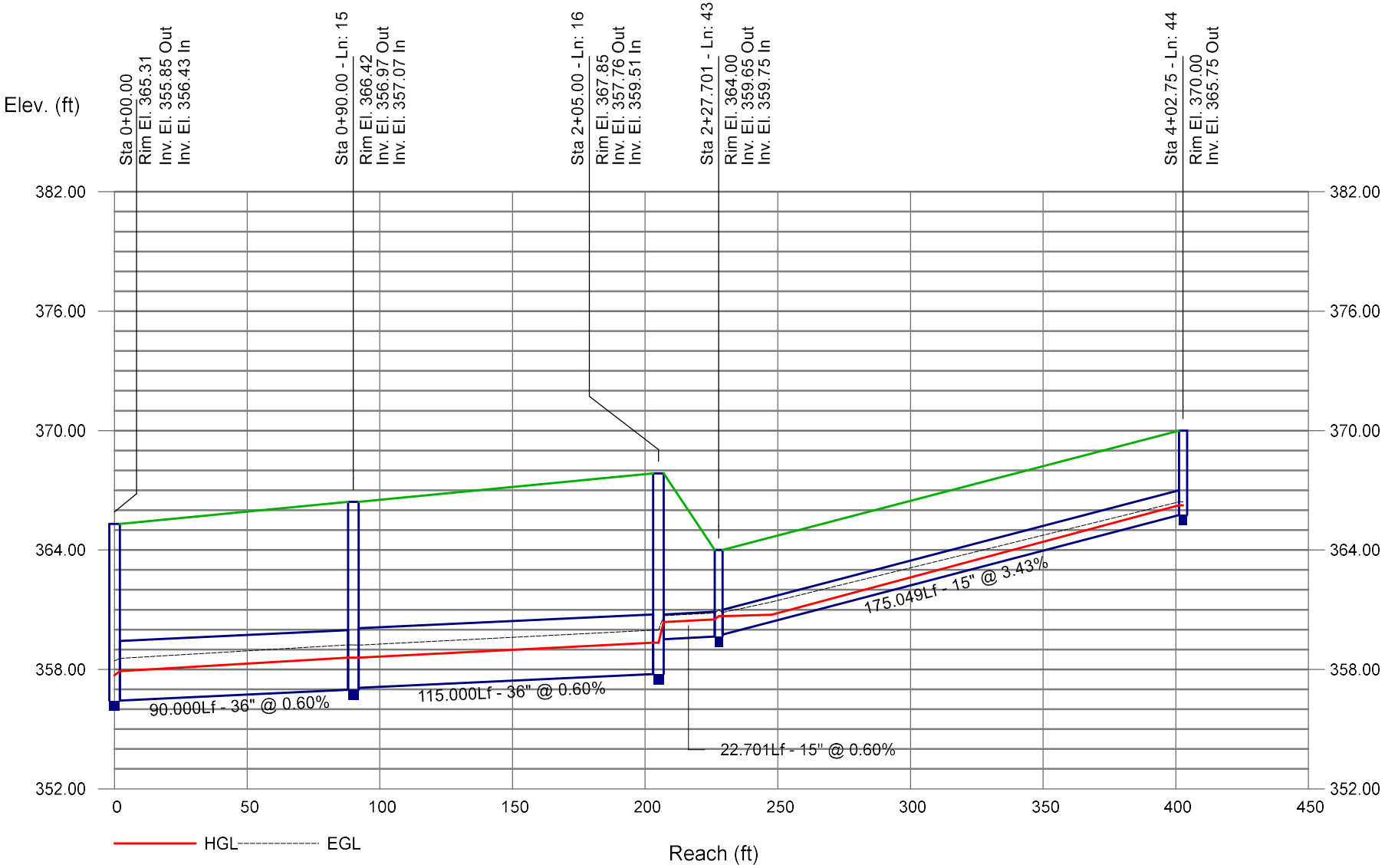

Storm Sewer Profile

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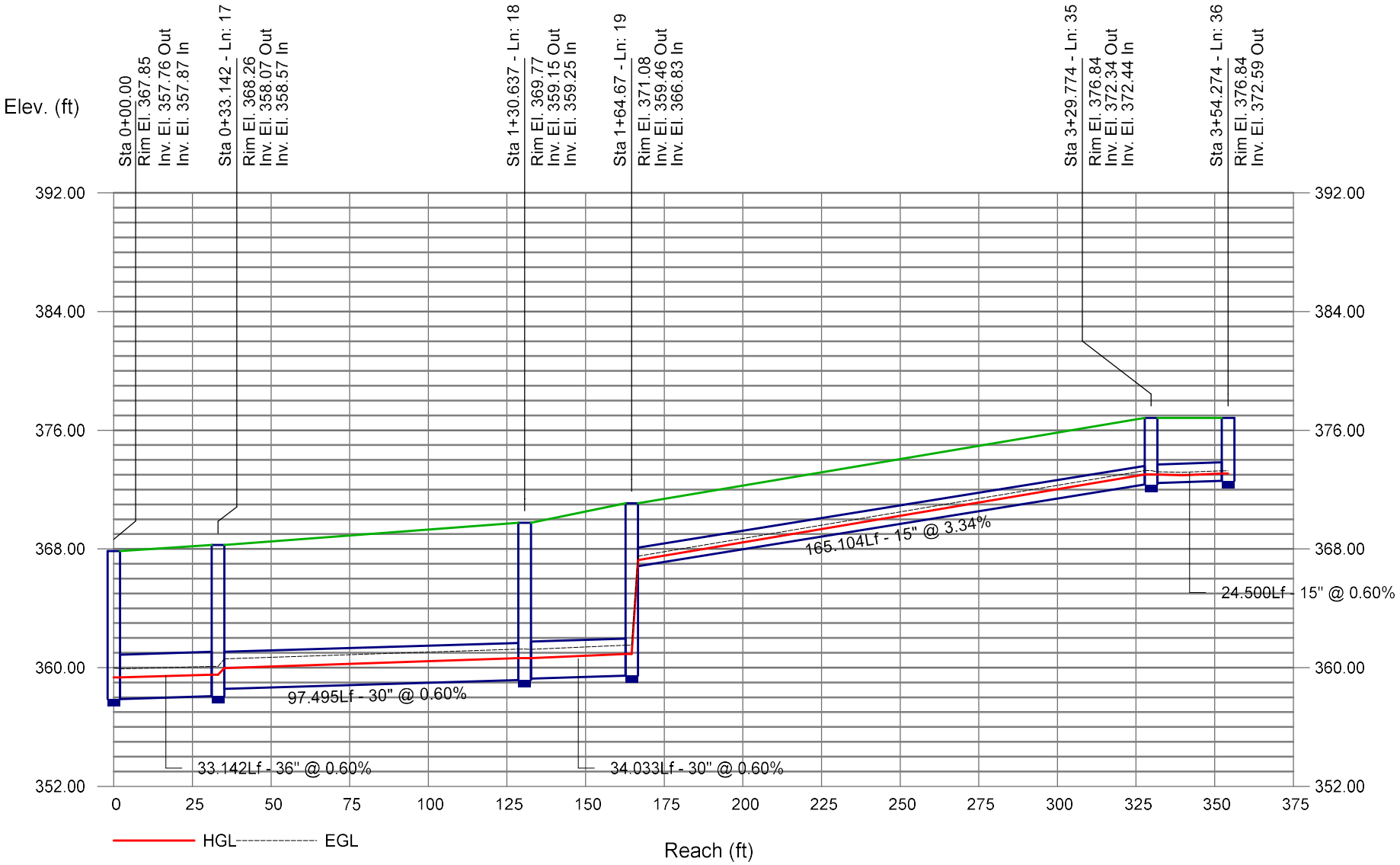

Storm Sewer Profile

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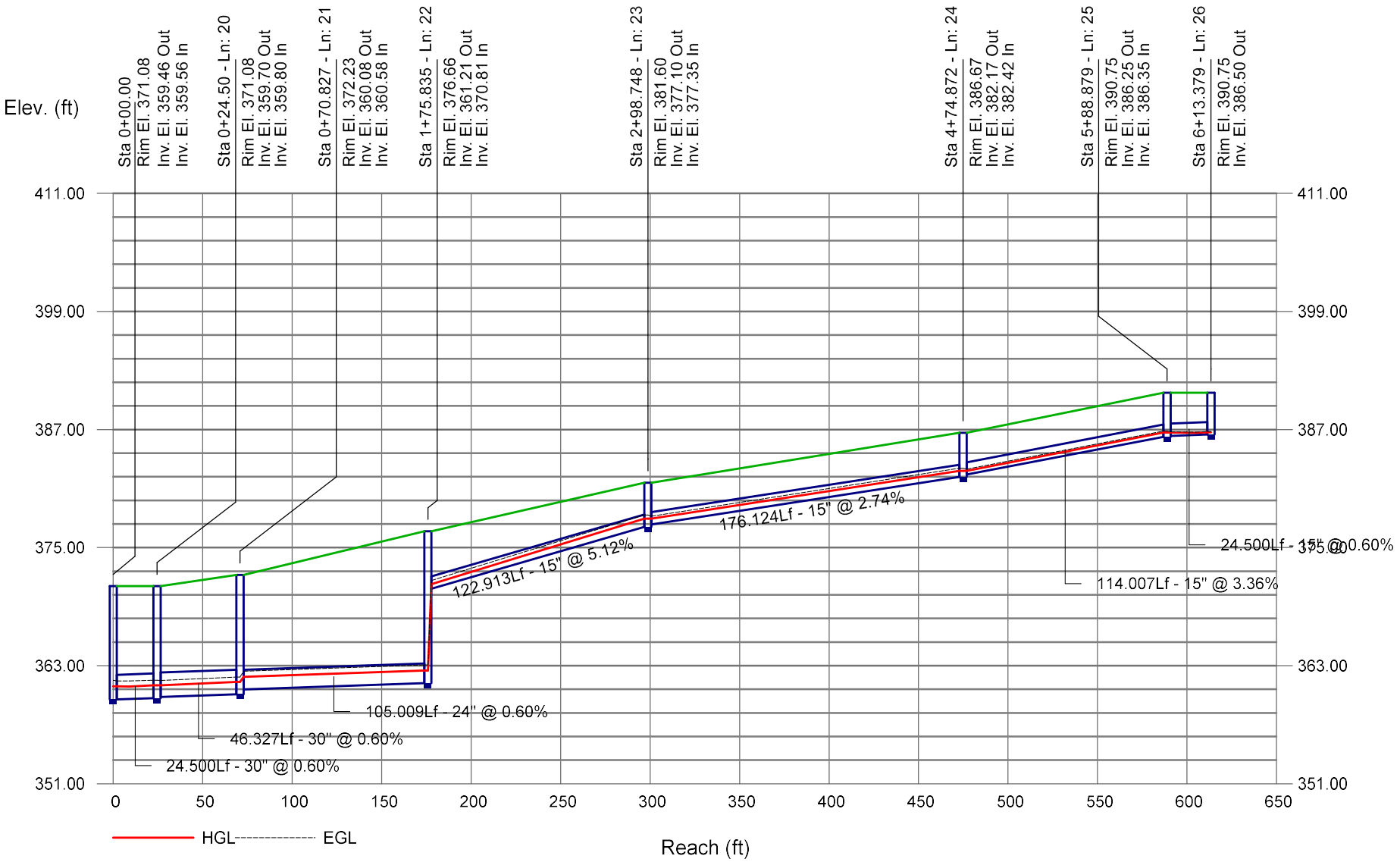
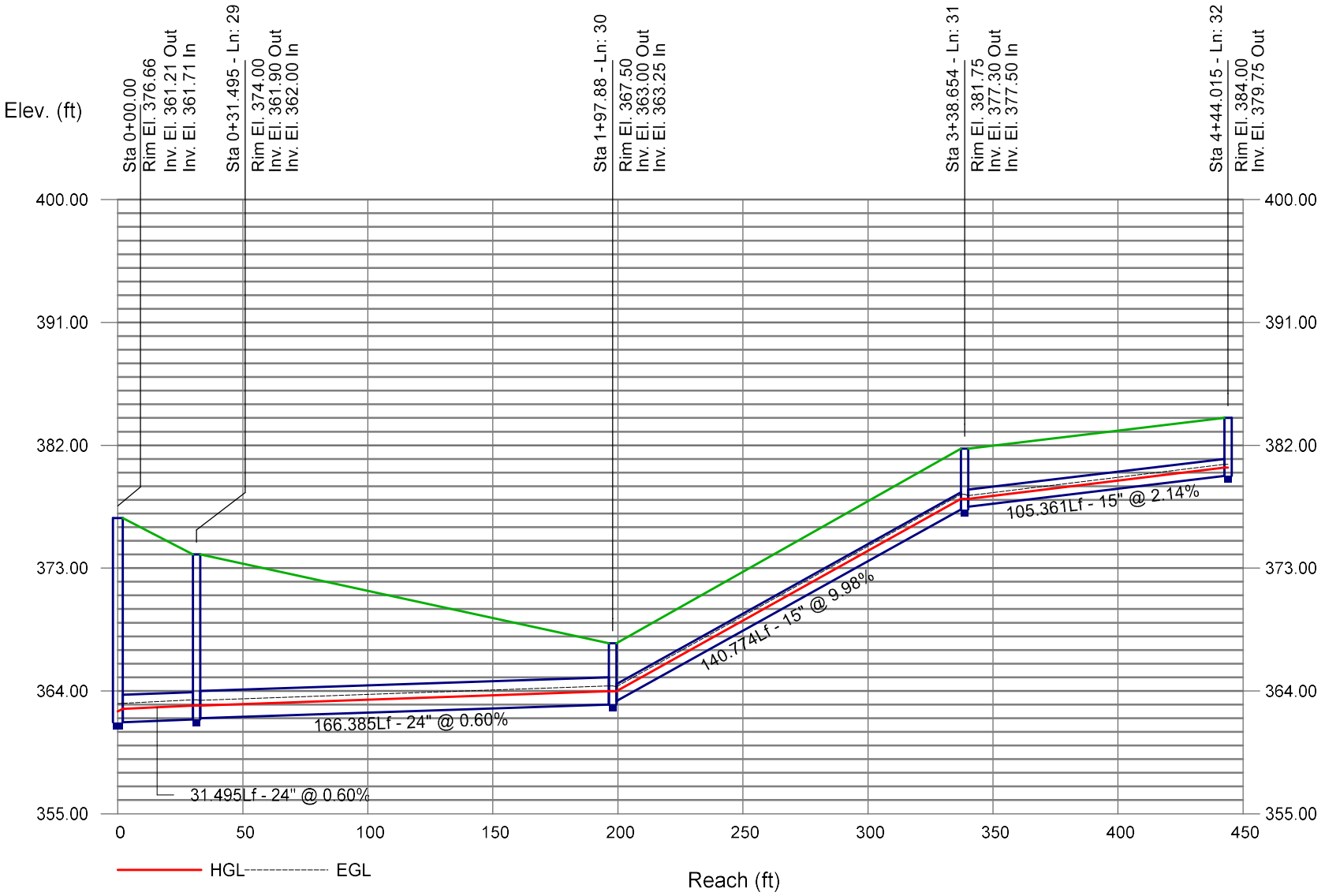


Storm Sewer Profile

Proj. file: Storm System 200.stm



Storm Sewer Profile

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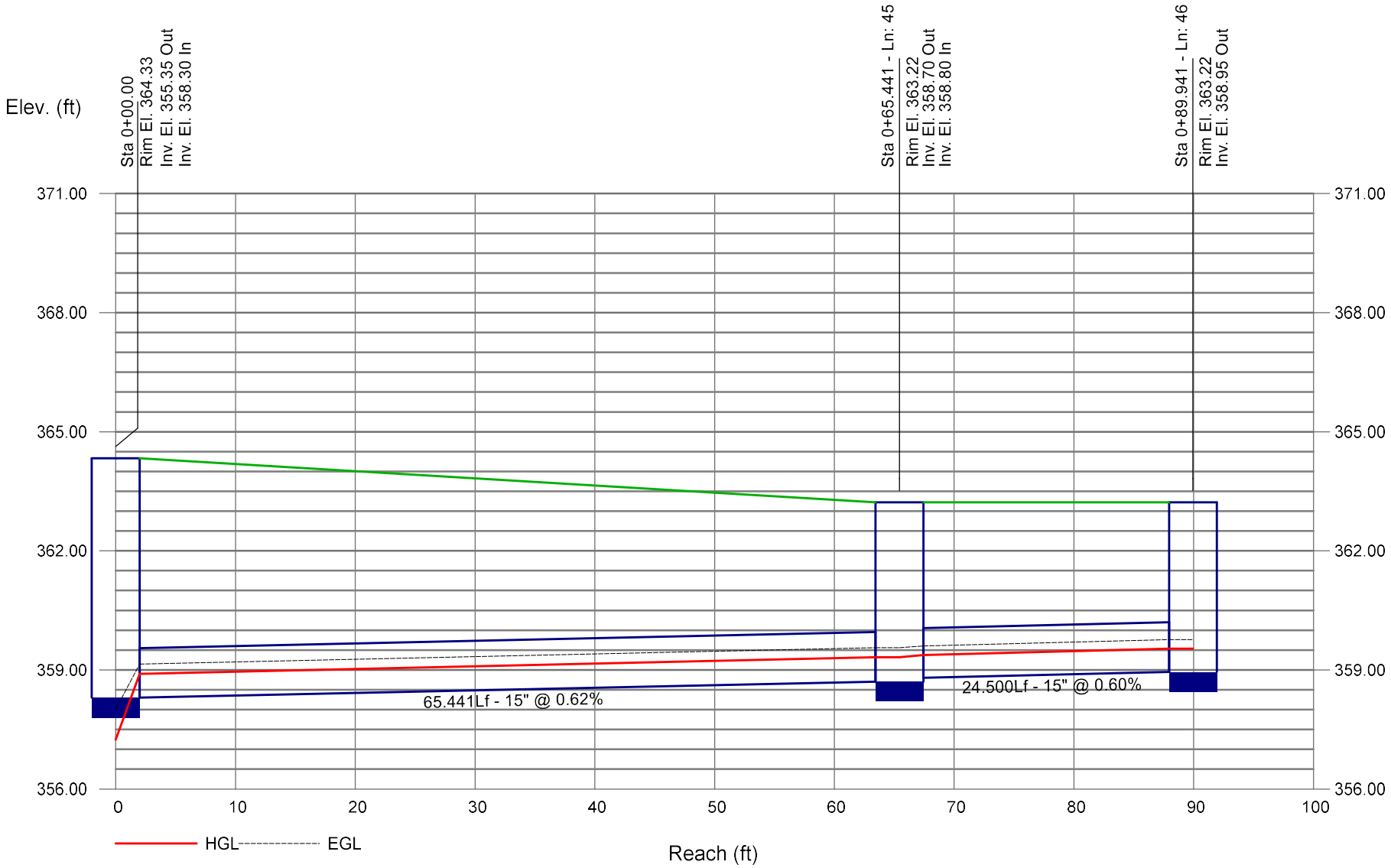

Storm Sewer Profile

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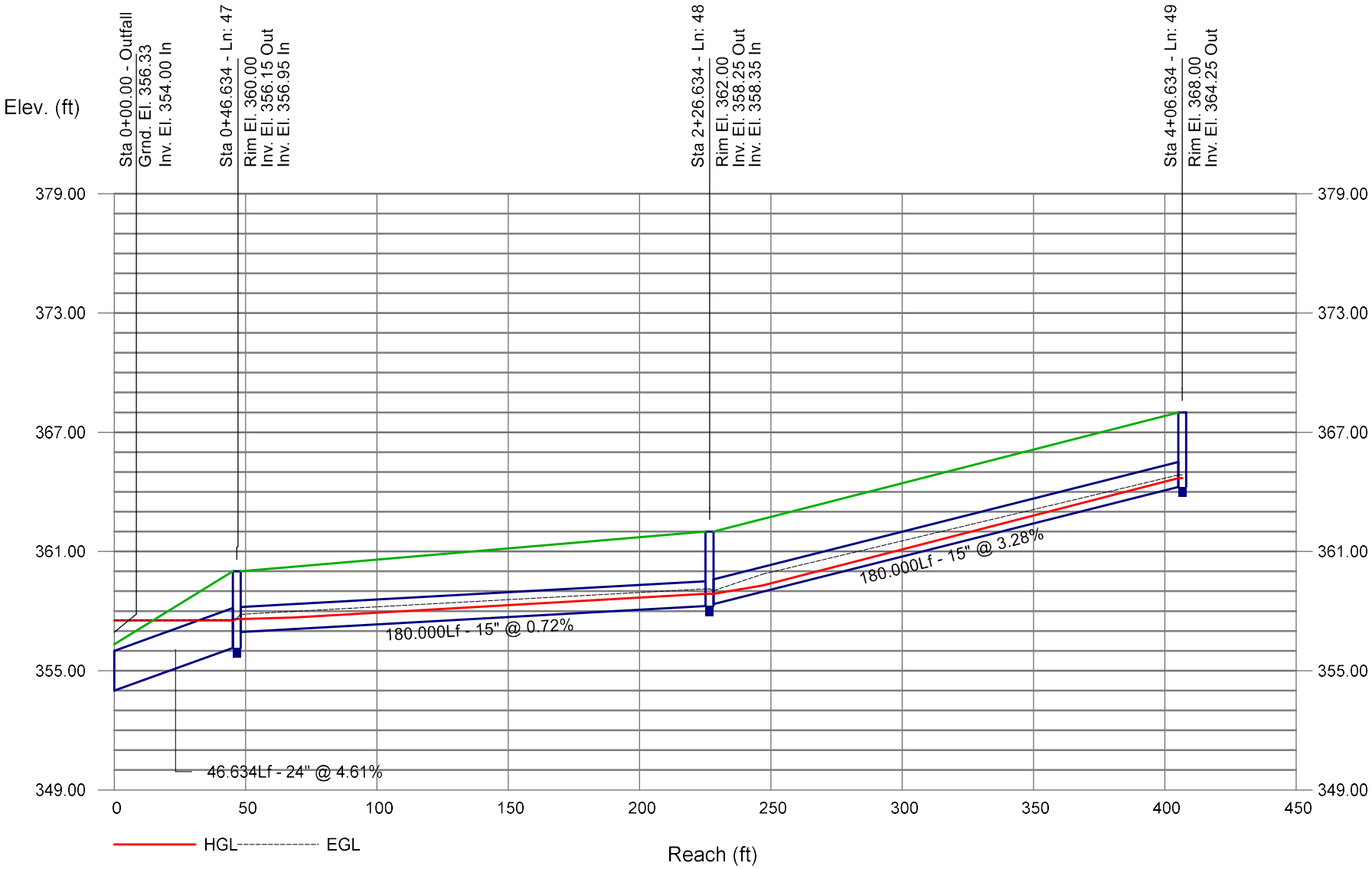
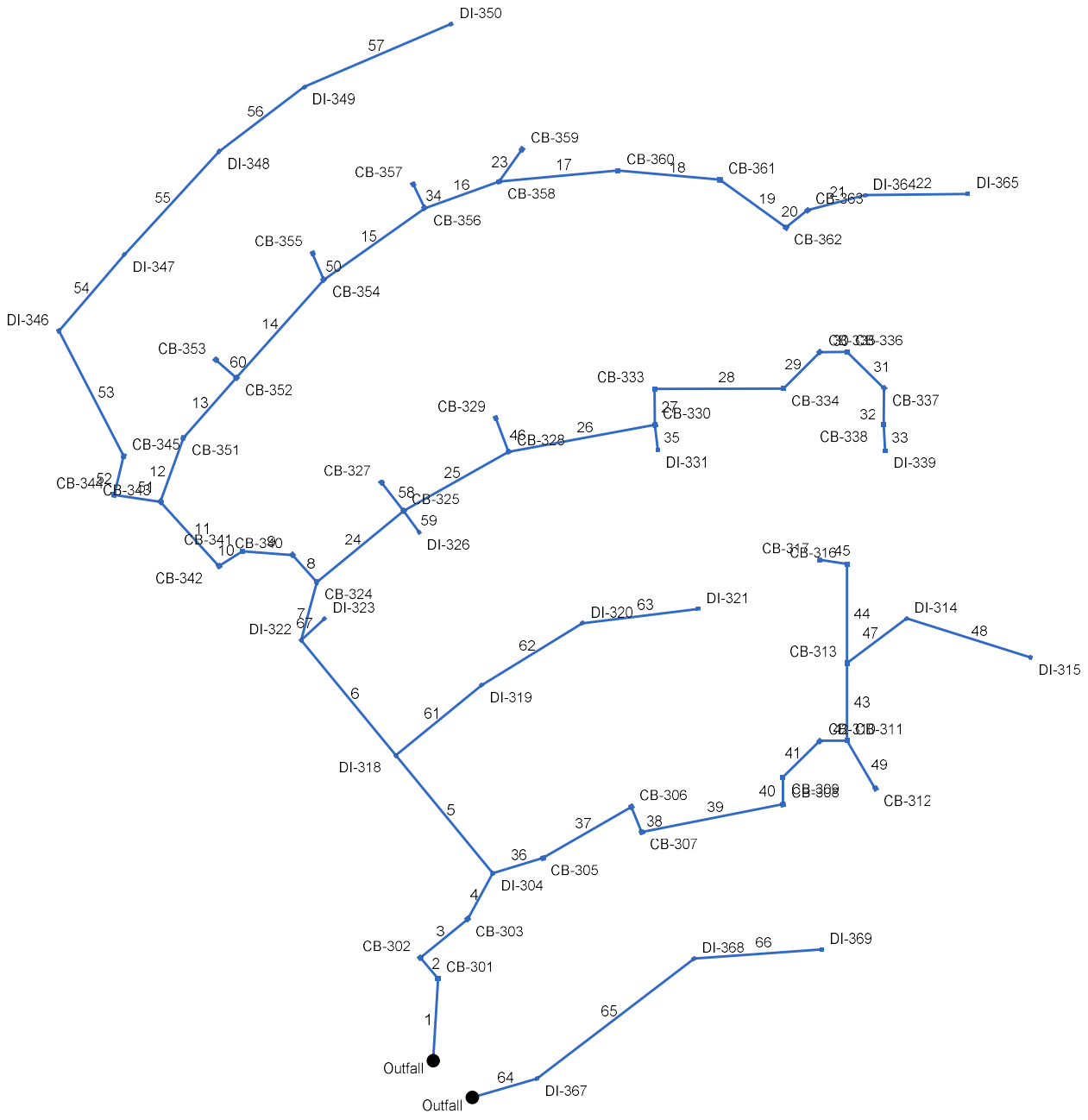


SYSTEM 300 – REPORTS AND PROFILES

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: Storm System 300.stm	Number of lines: 67	Date: 11/23/2020

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	300-301	46.61	54	Cir	73.973	375.50	375.90	0.541	379.98	377.87	n/a	377.87	End	Combination
2	301-302	45.05	48	Cir	24.500	376.00	376.15	0.600	377.87	378.16	n/a	378.16	1	Combination
3	302-303	43.89	48	Cir	54.439	376.25	376.55	0.545	378.16	378.53	0.50	378.53	2	Combination
4	303-304	43.67	42	Cir	47.354	376.65	376.90	0.537	378.58	378.96	n/a	378.96	3	DropGrate
5	304-318	32.99	42	Cir	137.245	377.00	377.70	0.512	378.96	379.48	n/a	379.48 j	4	DropGrate
6	318-322	28.65	42	Cir	134.194	377.80	378.50	0.518	379.48	380.15	n/a	380.15 j	5	DropGrate
7	322-324	27.62	42	Cir	54.146	378.60	378.90	0.563	380.15	380.52	0.90	380.52	6	Combination
8	324-340	15.49	30	Cir	32.523	379.00	379.20	0.600	380.52	380.53	n/a	380.53 j	7	Combination
9	340-341	14.70	30	Cir	45.297	379.30	379.55	0.556	380.53	380.84	0.50	380.84	8	Combination
10	341-342	14.41	30	Cir	24.851	379.65	379.80	0.600	380.84	381.08	n/a	381.08	9	Combination
11	342-343	14.41	30	Cir	78.115	379.90	380.60	0.894	381.08	381.88	n/a	381.88	10	Combination
12	343-351	10.66	24	Cir	61.235	383.70	384.30	0.992	384.66	385.47	n/a	385.47	11	Combination
13	351-352	10.68	24	Cir	71.708	384.40	384.80	0.558	385.56	385.97	n/a	385.97	12	Combination
14	352-354	7.17	18	Cir	118.259	385.30	387.00	1.438	386.11	388.04	0.65	388.04	13	Combination
15	354-356	5.50	18	Cir	111.099	387.10	391.30	3.783	388.04	392.21	n/a	392.21 j	14	Combination
16	356-358	4.27	15	Cir	70.723	391.60	393.30	2.402	392.21	394.13	0.35	394.13	15	Combination
17	358-360	2.69	15	Cir	106.972	393.40	394.00	0.563	394.13	394.66	n/a	394.66 j	16	Combination
18	360-361	2.44	15	Cir	91.815	394.10	394.70	0.654	394.70	395.33	n/a	395.33	17	Combination
19	361-362	2.31	15	Cir	73.290	394.80	395.20	0.545	395.42	395.81	0.34	396.15	18	Combination
20	362-363	1.87	15	Cir	24.490	395.30	395.45	0.600	396.15	395.99	0.14	395.99	19	Combination
21	363-364	1.53	15	Cir	53.673	395.55	395.90	0.656	396.01	396.39	0.09	396.39	20	DropGrate
22	364-365	1.42	15	Cir	92.471	396.00	396.60	0.649	396.45	397.07	n/a	397.07	21	DropGrate
23	358-359	1.09	15	Cir	36.064	394.60	395.70	3.050	394.86	396.11	n/a	396.11	16	Combination
24	324-325	14.34	24	Cir	101.094	384.35	386.10	1.729	385.33	387.46	0.92	387.46	7	Combination

Project File: Storm System 300.stm | Number of lines: 67 | Run Date: 11/23/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	325-328	11.26	24	Cir	108.023	386.20	389.25	2.825	387.46	390.45	n/a	390.45 j	24	Combination
26	328-330	9.82	24	Cir	133.249	389.35	390.15	0.600	390.45	391.27	n/a	391.27	25	Combination
27	330-333	8.53	24	Cir	32.500	390.25	390.65	1.216	391.27	391.69	0.62	391.69	26	Combination
28	333-334	7.35	24	Cir	115.582	391.15	392.15	0.868	391.96	393.11	n/a	393.11	27	Combination
29	334-335	6.66	24	Cir	46.267	392.25	392.50	0.535	393.13	393.41	n/a	393.41	28	Combination
30	335-336	5.83	18	Cir	24.501	393.10	393.25	0.641	394.02	394.19	n/a	394.19	29	Combination
31	336-337	5.03	18	Cir	46.364	393.35	393.60	0.535	394.24	394.49	0.38	394.86	30	Combination
32	337-338	4.00	15	Cir	32.501	393.70	393.90	0.600	394.86	394.95	0.10	395.05	31	Combination
33	338-339	2.23	15	Cir	23.856	394.00	394.15	0.642	395.05	394.75	0.23	394.75	32	DropGrate
34	356-357	0.96	15	Cir	24.502	391.56	391.71	0.600	392.21	392.09	0.14	392.09	15	Combination
35	330-331	0.83	15	Cir	22.879	390.94	391.08	0.600	391.29	391.44	0.13	391.44	26	DropGrate
36	304-305	11.92	24	Cir	46.652	379.16	380.49	2.851	379.93	381.73	0.26	381.73	4	Combination
37	305-306	11.15	24	Cir	91.872	380.59	382.83	2.441	381.73	384.03	n/a	384.03	36	Combination
38	306-307	9.91	24	Cir	24.501	382.93	383.08	0.600	384.03	384.21	n/a	384.21	37	Combination
39	307-308	9.40	24	Cir	129.003	383.18	385.29	1.633	384.21	386.38	0.66	386.38	38	Combination
40	308-309	7.83	24	Cir	24.490	385.39	385.53	0.600	386.38	386.53	0.44	386.53	39	Combination
41	309-310	7.33	24	Cir	46.532	385.63	385.90	0.579	386.55	386.86	n/a	386.86	40	Combination
42	310-311	6.98	18	Cir	24.500	386.00	386.20	0.804	386.96	387.22	n/a	387.22	41	Combination
43	311-313	5.10	18	Cir	69.883	386.40	388.07	2.390	387.22	388.94	n/a	388.94	42	Combination
44	313-316	1.85	15	Cir	89.147	388.32	390.75	2.727	388.94	391.29	n/a	391.29 j	43	Combination
45	316-317	1.12	15	Cir	24.801	390.85	391.00	0.600	391.29	391.42	0.15	391.42	44	Combination
46	328-329	1.38	15	Cir	32.502	390.14	390.33	0.600	390.58	390.79	n/a	390.79	25	Combination
47	313-314	2.43	15	Cir	66.866	388.32	388.90	0.867	388.94	389.52	0.31	389.52	43	DropGrate
48	314-315	0.72	15	Cir	116.666	389.00	390.55	1.329	389.52	390.88	n/a	390.88 j	47	DropGrate

Project File: Storm System 300.stm | Number of lines: 67 | Run Date: 11/23/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
49	311-312	1.80	15	Cir	49.998	387.54	387.74	0.400	388.12	388.32	0.16	388.48	42	Combination
50	354-355	1.17	15	Cir	26.238	387.38	387.66	1.067	388.04	388.09	n/a	388.09 j	14	Combination
51	343-344	4.11	18	Cir	42.052	381.49	381.70	0.505	382.28	382.50	0.44	382.93	11	Combination
52	344-345	3.55	18	Cir	36.168	381.80	381.99	0.517	382.93	382.95	0.14	383.10	51	Combination
53	345-346	2.89	15	Cir	126.731	382.09	383.10	0.797	383.10	383.78	n/a	383.78 j	52	DropGrate
54	346-347	2.46	15	Cir	90.374	383.20	383.52	0.356	383.93	384.25	0.09	384.33	53	DropGrate
55	347-348	1.89	15	Cir	126.041	383.62	384.70	0.856	384.33	385.25	n/a	385.25 j	54	DropGrate
56	348-349	1.47	15	Cir	95.853	384.80	387.25	2.556	385.25	387.73	n/a	387.73	55	DropGrate
57	349-350	0.83	15	Cir	143.487	387.35	391.85	3.136	387.73	392.21	n/a	392.21 j	56	DropGrate
58	325-327	1.55	15	Cir	32.504	387.06	387.25	0.600	387.53	387.74	0.18	387.74	24	Combination
59	325-326	1.78	15	Cir	23.745	386.50	386.62	0.516	387.46	387.47	0.06	387.53	24	DropGrate
60	352-353	2.60	15	Cir	24.500	385.55	385.70	0.600	386.19	386.35	0.26	386.35	13	Combination
61	318-319	4.20	15	Cir	99.568	381.71	382.31	0.600	382.59	383.19	0.16	383.35	5	DropGrate
62	319-320	2.87	15	Cir	106.170	382.41	383.78	1.290	383.35	384.46	n/a	384.46 j	61	DropGrate
63	320-321	1.33	15	Cir	104.706	383.88	386.87	2.856	384.46	387.32	n/a	387.32 j	62	DropGrate
64	366-367	2.68	15	Cir	60.502	376.00	379.00	4.960	379.98	380.06	0.06	380.12	End	DropGrate
65	367-368	1.71	15	Cir	177.865	379.10	383.40	2.417	380.12	383.92	n/a	383.92 j	64	DropGrate
66	368-369	0.98	15	Cir	114.531	383.50	386.25	2.401	383.92	386.64	n/a	386.64 j	65	DropGrate
67	322-323	1.40	15	Cir	28.549	383.18	383.35	0.600	383.63	383.82	0.17	383.82	6	DropGrate

Project File: Storm System 300.stm | Number of lines: 67 | Run Date: 11/23/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	73.973	0.53	14.14	0.66	0.35	9.59	5.0	15.9	4.9	46.61	144.6	4.94	54	0.54	375.50	375.90	379.98	377.87	380.54	383.15	300-301
2	1	24.500	0.44	13.61	0.68	0.30	9.24	5.0	15.7	4.9	45.05	111.3	7.48	48	0.60	376.00	376.15	377.87	378.16	383.15	383.15	301-302
3	2	54.439	0.12	13.17	0.72	0.09	8.94	5.0	15.5	4.9	43.89	106.0	7.25	48	0.54	376.25	376.55	378.16	378.53	383.15	383.58	302-303
4	3	47.354	0.26	13.05	0.72	0.19	8.85	5.0	15.3	4.9	43.67	73.70	7.70	42	0.54	376.65	376.90	378.58	378.96	383.58	384.16	303-304
5	4	137.245	0.49	9.76	0.68	0.33	6.57	5.0	14.7	5.0	32.99	72.02	6.34	42	0.51	377.00	377.70	378.96	379.48	384.16	387.28	304-318
6	5	134.194	0.06	8.33	0.87	0.05	5.59	5.0	14.0	5.1	28.65	72.40	6.36	42	0.52	377.80	378.50	379.48	380.15	387.28	388.74	318-322
7	6	54.146	0.07	8.01	0.85	0.06	5.34	5.0	13.8	5.2	27.62	75.50	6.53	42	0.56	378.60	378.90	380.15	380.52	388.74	389.35	322-324
8	7	32.523	0.26	4.42	0.66	0.17	2.98	5.0	13.6	5.2	15.49	31.76	5.41	30	0.60	379.00	379.20	380.52	380.53	389.35	389.33	324-340
9	8	45.297	0.09	4.16	0.75	0.07	2.81	5.0	13.4	5.2	14.70	30.58	5.94	30	0.56	379.30	379.55	380.53	380.84	389.33	389.03	340-341
10	9	24.851	0.04	4.07	0.84	0.03	2.74	5.0	13.3	5.3	14.41	31.76	5.98	30	0.60	379.65	379.80	380.84	381.08	389.03	389.11	341-342
11	10	78.115	0.08	4.03	0.72	0.06	2.71	5.0	12.8	5.3	14.41	38.79	6.03	30	0.89	379.90	380.60	381.08	381.88	389.11	390.57	342-343
12	11	61.235	0.02	2.76	0.85	0.02	1.89	5.0	11.0	5.7	10.66	22.53	6.33	24	0.99	383.70	384.30	384.66	385.47	390.57	390.56	343-351
13	12	71.708	0.39	2.74	0.70	0.27	1.87	5.0	10.7	5.7	10.68	16.90	5.64	24	0.56	384.40	384.80	385.56	385.97	390.56	389.95	351-352
14	13	118.259	0.20	1.84	0.71	0.14	1.23	5.0	10.2	5.8	7.17	12.59	6.43	18	1.44	385.30	387.00	386.11	388.04	389.95	391.63	352-354
15	14	111.099	0.12	1.41	0.70	0.08	0.93	5.0	9.7	5.9	5.50	20.43	4.85	18	3.78	387.10	391.30	388.04	392.21	391.63	395.96	354-356
16	15	70.723	0.18	1.10	0.69	0.12	0.71	5.0	9.4	6.0	4.27	10.01	6.06	15	2.40	391.60	393.30	392.21	394.13	395.96	398.89	356-358
17	16	106.972	0.07	0.70	0.73	0.05	0.44	5.0	8.6	6.2	2.69	4.84	3.84	15	0.56	393.40	394.00	394.13	394.66	398.89	402.31	358-360
18	17	91.815	0.04	0.63	0.72	0.03	0.38	5.0	7.9	6.3	2.44	5.22	4.08	15	0.65	394.10	394.70	394.70	395.33	402.31	402.47	360-361
19	18	73.290	0.10	0.59	0.71	0.07	0.36	5.0	7.3	6.5	2.31	4.77	3.86	15	0.55	394.80	395.20	395.42	395.81	402.47	400.98	361-362
20	19	24.490	0.07	0.49	0.84	0.06	0.28	5.0	7.0	6.6	1.87	5.00	2.88	15	0.60	395.30	395.45	396.15	395.99	400.98	400.98	362-363
21	20	53.673	0.08	0.42	0.36	0.03	0.23	5.0	6.3	6.8	1.53	5.23	3.57	15	0.66	395.55	395.90	396.01	396.39	400.98	400.20	363-364
22	21	92.471	0.34	0.34	0.58	0.20	0.20	5.0	5.0	7.2	1.42	5.20	3.48	15	0.65	396.00	396.60	396.45	397.07	400.20	400.85	364-365

Project File: Storm System 300.stm

Number of lines: 67

Run Date: 11/23/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	16	36.064	0.22	0.22	0.69	0.15	0.15	5.0	5.0	7.2	1.09	11.28	4.46	15	3.05	394.60	395.70	394.86	396.11	398.89	399.94	358-359
24	7	101.094	0.08	3.52	0.85	0.07	2.30	5.0	8.3	6.2	14.34	29.74	7.83	24	1.73	384.35	386.10	385.33	387.46	389.35	391.50	324-325
25	24	108.023	0.09	2.63	0.85	0.08	1.77	5.0	7.9	6.4	11.26	38.01	5.55	24	2.82	386.20	389.25	387.46	390.45	391.50	394.58	325-328
26	25	133.249	0.11	2.14	0.84	0.09	1.50	5.0	7.2	6.5	9.82	17.53	5.48	24	0.60	389.35	390.15	390.45	391.27	394.58	396.34	328-330
27	26	32.500	0.32	1.86	0.68	0.22	1.29	5.0	7.0	6.6	8.53	24.94	5.23	24	1.22	390.25	390.65	391.27	391.69	396.34	396.34	330-333
28	27	115.582	0.15	1.54	0.78	0.12	1.08	5.0	6.1	6.8	7.35	21.07	5.51	24	0.87	391.15	392.15	391.96	393.11	396.34	397.54	333-334
29	28	46.267	0.18	1.39	0.69	0.12	0.96	5.0	5.8	6.9	6.66	16.55	4.87	24	0.54	392.25	392.50	393.13	393.41	397.54	398.50	334-335
30	29	24.501	0.19	1.21	0.65	0.12	0.84	5.0	5.7	7.0	5.83	8.41	5.09	18	0.64	393.10	393.25	394.02	394.19	398.50	398.50	335-336
31	30	46.364	0.20	1.02	0.75	0.15	0.71	5.0	5.4	7.1	5.03	7.68	4.64	18	0.54	393.35	393.60	394.24	394.49	398.50	398.57	336-337
32	31	32.501	0.35	0.82	0.72	0.25	0.56	5.0	5.2	7.1	4.00	5.00	3.49	15	0.60	393.70	393.90	394.86	394.95	398.57	398.57	337-338
33	32	23.856	0.47	0.47	0.66	0.31	0.31	5.0	5.0	7.2	2.23	5.17	2.94	15	0.64	394.00	394.15	395.05	394.75	398.57	397.58	338-339
34	15	24.502	0.19	0.19	0.70	0.13	0.13	5.0	5.0	7.2	0.96	5.00	2.25	15	0.60	391.56	391.71	392.21	392.09	395.96	395.96	356-357
35	26	22.879	0.17	0.17	0.68	0.12	0.12	5.0	5.0	7.2	0.83	5.00	2.94	15	0.60	390.94	391.08	391.29	391.44	396.34	395.33	330-331
36	4	46.652	0.23	3.03	0.71	0.16	2.10	5.0	10.9	5.7	11.92	38.19	8.28	24	2.85	379.16	380.49	379.93	381.73	384.16	385.59	304-305
37	36	91.872	0.32	2.80	0.69	0.22	1.93	5.0	10.5	5.8	11.15	35.34	5.86	24	2.44	380.59	382.83	381.73	384.03	385.59	388.18	305-306
38	37	24.501	0.19	2.48	0.66	0.13	1.71	5.0	10.4	5.8	9.91	17.52	5.53	24	0.60	382.93	383.08	384.03	384.21	388.18	388.18	306-307
39	38	129.003	0.42	2.29	0.65	0.27	1.59	5.0	9.7	5.9	9.40	28.90	5.57	24	1.63	383.18	385.29	384.21	386.38	388.18	390.57	307-308
40	39	24.490	0.12	1.87	0.81	0.10	1.32	5.0	9.6	6.0	7.83	17.52	5.02	24	0.60	385.39	385.53	386.38	386.53	390.57	390.57	308-309
41	40	46.532	0.08	1.75	0.78	0.06	1.22	5.0	9.3	6.0	7.33	17.20	5.08	24	0.58	385.63	385.90	386.55	386.86	390.57	391.16	309-310
42	41	24.500	0.10	1.67	0.71	0.07	1.16	5.0	9.2	6.0	6.98	9.41	5.64	18	0.80	386.00	386.20	386.96	387.22	391.16	391.16	310-311
43	42	69.883	0.24	1.19	0.76	0.18	0.83	5.0	8.8	6.1	5.10	16.23	4.98	18	2.39	386.40	388.07	387.22	388.94	391.16	392.57	311-313
44	43	89.147	0.15	0.37	0.71	0.11	0.26	5.0	5.5	7.0	1.85	10.66	3.35	15	2.73	388.32	390.75	388.94	391.29	392.57	395.14	313-316

Project File: Storm System 300.stm | Number of lines: 67 | Run Date: 11/23/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
45	44	24.801	0.22	0.22	0.71	0.16	0.16	5.0	5.0	7.2	1.12	5.00	3.02	15	0.60	390.85	391.00	391.29	391.42	395.14	395.25	316-317
46	25	32.502	0.40	0.40	0.48	0.19	0.19	5.0	5.0	7.2	1.38	5.00	3.40	15	0.60	390.14	390.33	390.58	390.79	394.58	394.58	328-329
47	43	66.866	0.43	0.58	0.67	0.29	0.39	5.0	8.3	6.2	2.43	6.01	3.99	15	0.87	388.32	388.90	388.94	389.52	392.57	393.25	313-314
48	47	116.666	0.15	0.15	0.67	0.10	0.10	5.0	5.0	7.2	0.72	7.44	2.12	15	1.33	389.00	390.55	389.52	390.88	393.25	394.80	314-315
49	42	49.998	0.38	0.38	0.66	0.25	0.25	5.0	5.0	7.2	1.80	4.08	3.23	15	0.40	387.54	387.74	388.12	388.32	391.16	391.39	311-312
50	14	26.238	0.23	0.23	0.71	0.16	0.16	5.0	5.0	7.2	1.17	6.67	2.49	15	1.07	387.38	387.66	388.04	388.09	391.63	391.91	354-355
51	11	42.052	0.16	1.19	0.69	0.11	0.77	5.0	12.6	5.4	4.11	7.46	4.32	18	0.50	381.49	381.70	382.28	382.50	390.57	392.07	343-344
52	51	36.168	0.19	1.03	0.71	0.13	0.66	5.0	12.3	5.4	3.55	7.55	2.71	18	0.52	381.80	381.99	382.93	382.95	392.07	391.54	344-345
53	52	126.731	0.14	0.84	0.62	0.09	0.52	5.0	11.6	5.6	2.89	5.77	3.47	15	0.80	382.09	383.10	383.10	383.78	391.54	387.75	345-346
54	53	90.374	0.18	0.70	0.64	0.12	0.43	5.0	10.9	5.7	2.46	3.85	3.33	15	0.36	383.20	383.52	383.93	384.25	387.75	387.05	346-347
55	54	126.041	0.13	0.52	0.62	0.08	0.32	5.0	9.7	5.9	1.89	5.98	3.14	15	0.86	383.62	384.70	384.33	385.25	387.05	389.05	347-348
56	55	95.853	0.20	0.39	0.61	0.12	0.24	5.0	8.5	6.2	1.47	10.32	3.57	15	2.56	384.80	387.25	385.25	387.73	389.05	391.60	348-349
57	56	143.487	0.19	0.19	0.61	0.12	0.12	5.0	5.0	7.2	0.83	11.44	2.76	15	3.14	387.35	391.85	387.73	392.21	391.60	396.10	349-350
58	24	32.504	0.43	0.43	0.50	0.22	0.22	5.0	5.0	7.2	1.55	5.00	3.52	15	0.60	387.06	387.25	387.53	387.74	391.50	391.50	325-327
59	24	23.745	0.38	0.38	0.65	0.25	0.25	5.0	5.0	7.2	1.78	4.64	1.87	15	0.52	386.50	386.62	387.46	387.47	391.50	390.67	325-326
60	13	24.500	0.51	0.51	0.71	0.36	0.36	5.0	5.0	7.2	2.60	5.00	4.09	15	0.60	385.55	385.70	386.19	386.35	389.95	389.95	352-353
61	5	99.568	0.32	0.94	0.68	0.22	0.65	5.0	7.3	6.5	4.20	5.00	4.57	15	0.60	381.71	382.31	382.59	383.19	387.28	386.66	318-319
62	61	106.170	0.36	0.62	0.68	0.24	0.43	5.0	6.6	6.7	2.87	7.34	3.56	15	1.29	382.41	383.78	383.35	384.46	386.66	388.13	319-320
63	62	104.706	0.26	0.26	0.71	0.18	0.18	5.0	5.0	7.2	1.33	10.91	2.83	15	2.86	383.88	386.87	384.46	387.32	388.13	391.12	320-321
64	End	60.502	0.28	0.69	0.65	0.18	0.45	5.0	9.4	6.0	2.68	14.38	2.29	15	4.96	376.00	379.00	379.98	380.06	377.52	381.90	366-367
65	64	177.865	0.20	0.41	0.64	0.13	0.26	5.0	7.4	6.5	1.71	10.04	2.58	15	2.42	379.10	383.40	380.12	383.92	381.90	386.90	367-368
66	65	114.531	0.21	0.21	0.65	0.14	0.14	5.0	5.0	7.2	0.98	10.01	2.86	15	2.40	383.50	386.25	383.92	386.64	386.90	389.97	368-369

Project File: Storm System 300.stm

Number of lines: 67

Run Date: 11/23/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
67	6	28.549	0.26	0.26	0.75	0.20	0.20	5.0	5.0	7.2	1.40	5.00	3.42	15	0.60	383.18	383.35	383.63	383.82	388.74	387.60	322-323

Project File: Storm System 300.stm

Number of lines: 67

Run Date: 11/23/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	54	46.61	375.50	379.98	4.48	6.70	2.93	0.75	380.73	0.000	73.973	375.90	377.87	1.97**	6.70	6.96	0.75	378.62	0.000	0.000	n/a	1.08	n/a
2	48	45.05	376.00	377.87	1.87	5.76	7.82	0.79	378.66	0.000	24.500	376.15	378.16	2.01**	6.31	7.14	0.79	378.95	0.000	0.000	n/a	1.50	n/a
3	48	43.89	376.25	378.16	1.91	5.91	7.42	0.78	378.94	0.000	54.439	376.55	378.53	1.98**	6.20	7.08	0.78	379.30	0.000	0.000	n/a	0.64	0.50
4	42	43.67	376.65	378.58	1.94*	5.47	7.98	0.86	379.44	0.000	47.354	376.90	378.96	2.06**	5.88	7.42	0.86	379.81	0.000	0.000	n/a	1.66	n/a
5	42	32.99	377.00	378.96	1.96	4.90	5.96	0.70	379.66	0.000	137.245	377.70	379.48 j	1.78**	4.90	6.73	0.70	380.18	0.000	0.000	n/a	1.50	n/a
6	42	28.65	377.80	379.48	1.68	4.46	6.29	0.64	380.12	0.000	134.194	378.50	380.15 j	1.65**	4.46	6.42	0.64	380.79	0.000	0.000	n/a	1.50	0.96
7	42	27.62	378.60	380.15	1.55	4.11	6.71	0.63	380.77	0.000	54.146	378.90	380.52	1.62**	4.35	6.35	0.63	381.15	0.000	0.000	n/a	1.43	0.90
8	30	15.49	379.00	380.52	1.52	2.65	4.96	0.53	381.06	0.000	32.523	379.20	380.53 j	1.33**	2.65	5.85	0.53	381.06	0.000	0.000	n/a	1.11	0.59
9	30	14.70	379.30	380.53	1.23	2.40	6.13	0.51	381.04	0.000	45.297	379.55	380.84	1.29**	2.56	5.75	0.51	381.36	0.000	0.000	n/a	0.97	0.50
10	30	14.41	379.65	380.84	1.19	2.31	6.24	0.51	381.35	0.000	24.851	379.80	381.08	1.28**	2.52	5.71	0.51	381.58	0.000	0.000	n/a	1.48	n/a
11	30	14.41	379.90	381.08	1.18	2.27	6.34	0.51	381.58	0.000	78.115	380.60	381.88	1.28**	2.52	5.71	0.51	382.38	0.000	0.000	n/a	1.54	n/a
12	24	10.66	383.70	384.66	0.97*	1.51	7.07	0.49	385.15	0.000	61.235	384.30	385.47	1.17**	1.91	5.59	0.49	385.96	0.000	0.000	n/a	0.63	n/a
13	24	10.68	384.40	385.56	1.15*	1.88	5.69	0.49	386.04	0.000	71.708	384.80	385.97	1.17**	1.91	5.59	0.49	386.46	0.000	0.000	n/a	1.50	n/a
14	18	7.17	385.30	386.11	0.81*	0.97	7.35	0.47	386.58	0.000	118.259	387.00	388.04	1.04**	1.30	5.51	0.47	388.51	0.000	0.000	n/a	1.38	0.65
15	18	5.50	387.10	388.04	0.94	1.11	4.75	0.38	388.42	0.000	111.099	391.30	392.21 j	0.90**	1.11	4.95	0.38	392.59	0.000	0.000	n/a	1.48	0.56
16	15	4.27	391.60	392.21	0.61	0.59	7.22	0.37	392.58	0.000	70.723	393.30	394.13	0.84**	0.87	4.89	0.37	394.51	0.000	0.000	n/a	0.93	0.35
17	15	2.69	393.40	394.13	0.74	0.65	3.58	0.20	394.33	0.407	106.972	394.00	394.66 j	0.66**	0.65	4.11	0.26	394.92	0.586	0.497	n/a	0.50	0.13
18	15	2.44	394.10	394.70	0.60*	0.58	4.18	0.25	394.95	0.000	91.815	394.70	395.33	0.62**	0.61	3.98	0.25	395.57	0.000	0.000	n/a	0.85	n/a
19	15	2.31	394.80	395.42	0.61*	0.59	3.86	0.23	395.65	0.545	73.290	395.20	395.81	0.61**	0.60	3.86	0.23	396.05	0.546	0.546	0.400	1.46	0.34
20	15	1.87	395.30	396.15	0.85	0.51	2.10	0.21	396.36	0.000	24.490	395.45	395.99	0.54**	0.51	3.65	0.21	396.20	0.000	0.000	n/a	0.69	0.14
21	15	1.53	395.55	396.01	0.46*	0.41	3.70	0.18	396.19	0.000	53.673	395.90	396.39	0.49**	0.45	3.43	0.18	396.57	0.000	0.000	n/a	0.50	0.09
22	15	1.42	396.00	396.45	0.45*	0.39	3.61	0.17	396.62	0.000	92.471	396.60	397.07	0.47**	0.42	3.35	0.17	397.25	0.000	0.000	n/a	1.00	n/a

Project File: Storm System 300.stm | Number of lines: 67 | Run Date: 11/23/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
23	15	1.09	394.60	394.86	0.26*	0.19	5.82	0.15	395.01	0.000	36.064	395.70	396.11	0.41**	0.35	3.11	0.15	396.26	0.000	0.000	n/a	1.00	n/a
24	24	14.34	384.35	385.33	0.98*	1.53	9.38	0.61	385.94	0.000	101.094	386.10	387.46	1.36**	2.28	6.29	0.61	388.08	0.000	0.000	n/a	1.50	0.92
25	24	11.26	386.20	387.46	1.26	1.97	5.39	0.51	387.97	0.000	108.023	389.25	390.45 j	1.20**	1.97	5.70	0.51	390.96	0.000	0.000	n/a	1.49	0.75
26	24	9.82	389.35	390.45	1.10	1.78	5.53	0.46	390.91	0.000	133.249	390.15	391.27	1.12**	1.81	5.43	0.46	391.73	0.000	0.000	n/a	1.50	n/a
27	24	8.53	390.25	391.27	1.02	1.61	5.30	0.41	391.68	0.000	32.500	390.65	391.69	1.04**	1.65	5.17	0.41	392.10	0.000	0.000	n/a	1.50	0.62
28	24	7.35	391.15	391.96	0.82*	1.20	6.10	0.38	392.34	0.000	115.582	392.15	393.11	0.96**	1.50	4.92	0.38	393.49	0.000	0.000	n/a	1.12	n/a
29	24	6.66	392.25	393.13	0.88*	1.34	4.98	0.35	393.48	0.000	46.267	392.50	393.41	0.91**	1.40	4.76	0.35	393.76	0.000	0.000	n/a	1.12	n/a
30	18	5.83	393.10	394.02	0.92*	1.14	5.13	0.40	394.41	0.000	24.501	393.25	394.19	0.93**	1.15	5.06	0.40	394.58	0.000	0.000	n/a	1.13	n/a
31	18	5.03	393.35	394.24	0.89*	1.09	4.63	0.33	394.57	0.535	46.364	393.60	394.49	0.88	1.08	4.64	0.33	394.82	0.536	0.535	0.248	1.13	0.38
32	15	4.00	393.70	394.86	1.16	1.19	3.36	0.18	395.04	0.332	32.501	393.90	394.95	1.05	1.10	3.63	0.20	395.15	0.367	0.349	0.113	0.50	0.10
33	15	2.23	394.00	395.05	1.05	0.58	2.02	0.23	395.28	0.000	23.856	394.15	394.75	0.60**	0.58	3.86	0.23	394.98	0.000	0.000	n/a	1.00	0.23
34	15	0.96	391.56	392.21	0.64	0.32	1.50	0.14	392.35	0.000	24.502	391.71	392.09	0.38**	0.32	2.99	0.14	392.23	0.000	0.000	n/a	1.00	0.14
35	15	0.83	390.94	391.29	0.34*	0.28	3.02	0.13	391.42	0.000	22.879	391.08	391.44	0.36**	0.29	2.87	0.13	391.57	0.000	0.000	n/a	1.00	0.13
36	24	11.92	379.16	379.93	0.77*	1.11	10.74	0.53	380.46	0.000	46.652	380.49	381.73	1.24**	2.04	5.83	0.53	382.26	0.000	0.000	n/a	0.50	0.26
37	24	11.15	380.59	381.73	1.14	1.85	6.03	0.50	382.23	0.000	91.872	382.83	384.03	1.20**	1.96	5.68	0.50	384.53	0.000	0.000	n/a	1.50	n/a
38	24	9.91	382.93	384.03	1.10	1.76	5.62	0.46	384.49	0.000	24.501	383.08	384.21	1.13**	1.82	5.45	0.46	384.67	0.000	0.000	n/a	1.48	n/a
39	24	9.40	383.18	384.21	1.03	1.62	5.80	0.44	384.65	0.000	129.003	385.29	386.38	1.10**	1.76	5.34	0.44	386.83	0.000	0.000	n/a	1.48	0.66
40	24	7.83	385.39	386.38	1.00	1.56	5.02	0.39	386.77	0.000	24.490	385.53	386.53	0.99**	1.56	5.02	0.39	386.92	0.000	0.000	n/a	1.12	0.44
41	24	7.33	385.63	386.55	0.91*	1.39	5.26	0.37	386.92	0.000	46.532	385.90	386.86	0.96**	1.49	4.91	0.37	387.24	0.000	0.000	n/a	1.12	n/a
42	18	6.98	386.00	386.96	0.96*	1.20	5.83	0.46	387.43	0.000	24.500	386.20	387.22	1.02**	1.28	5.44	0.46	387.68	0.000	0.000	n/a	1.99	n/a
43	18	5.10	386.40	387.22	0.82	0.99	5.15	0.36	387.58	0.000	69.883	388.07	388.94	0.87**	1.06	4.81	0.36	389.30	0.000	0.000	n/a	1.25	n/a
44	15	1.85	388.32	388.94	0.62	0.51	3.05	0.21	389.14	0.000	89.147	390.75	391.29 j	0.54**	0.51	3.64	0.21	391.50	0.000	0.000	n/a	1.49	n/a

Project File: Storm System 300.stm | Number of lines: 67 | Run Date: 11/23/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
45	15	1.12	390.85	391.29	0.44	0.36	2.91	0.15	391.44	0.000	24.801	391.00	391.42	0.42**	0.36	3.13	0.15	391.57	0.000	0.000	n/a	1.00	0.15
46	15	1.38	390.14	390.58	0.45*	0.40	3.48	0.17	390.76	0.000	32.502	390.33	390.79	0.46**	0.41	3.33	0.17	390.97	0.000	0.000	n/a	1.00	n/a
47	15	2.43	388.32	388.94	0.62	0.61	4.00	0.25	389.18	0.000	66.866	388.90	389.52	0.62**	0.61	3.97	0.25	389.77	0.000	0.000	n/a	1.27	0.31
48	15	0.72	389.00	389.52	0.52	0.26	1.49	0.12	389.64	0.000	116.666	390.55	390.88 j	0.33**	0.26	2.76	0.12	391.00	0.000	0.000	n/a	1.00	0.12
49	15	1.80	387.54	388.12	0.58*	0.56	3.22	0.16	388.28	0.400	49.998	387.74	388.32	0.58	0.56	3.23	0.16	388.48	0.404	0.402	0.201	1.00	0.16
50	15	1.17	387.38	388.04	0.66	0.37	1.80	0.16	388.19	0.000	26.238	387.66	388.09 j	0.43**	0.37	3.17	0.16	388.24	0.000	0.000	n/a	1.00	n/a
51	18	4.11	381.49	382.28	0.79*	0.95	4.32	0.29	382.57	0.504	42.052	381.70	382.50	0.79	0.95	4.32	0.29	382.79	0.505	0.505	0.212	1.50	0.44
52	18	3.55	381.80	382.93	1.13	1.43	2.48	0.10	383.03	0.135	36.168	381.99	382.95	0.97	1.20	2.95	0.14	383.09	0.205	0.170	0.061	1.06	0.14
53	15	2.89	382.09	383.10	1.01	0.69	2.72	0.28	383.37	0.000	126.731	383.10	383.78 j	0.68**	0.69	4.22	0.28	384.06	0.000	0.000	n/a	1.41	0.39
54	15	2.46	383.20	383.93	0.73*	0.74	3.33	0.17	384.10	0.356	90.374	383.52	384.25	0.73	0.74	3.32	0.17	384.42	0.355	0.355	0.321	0.50	0.09
55	15	1.89	383.62	384.33	0.71	0.52	2.61	0.21	384.54	0.000	126.041	384.70	385.25 j	0.55**	0.52	3.66	0.21	385.45	0.000	0.000	n/a	0.50	0.10
56	15	1.47	384.80	385.25	0.45	0.39	3.75	0.18	385.43	0.000	95.853	387.25	387.73	0.48**	0.43	3.39	0.18	387.91	0.000	0.000	n/a	0.50	n/a
57	15	0.83	387.35	387.73	0.38	0.29	2.64	0.13	387.86	0.000	143.487	391.85	392.21 j	0.36**	0.29	2.88	0.13	392.34	0.000	0.000	n/a	1.00	n/a
58	15	1.55	387.06	387.53	0.48*	0.43	3.59	0.18	387.72	0.000	32.504	387.25	387.74	0.49**	0.45	3.44	0.18	387.93	0.000	0.000	n/a	1.00	0.18
59	15	1.78	386.50	387.46	0.96	1.01	1.75	0.05	387.51	0.085	23.745	386.62	387.47	0.85	0.89	1.99	0.06	387.53	0.116	0.101	0.024	1.00	0.06
60	15	2.60	385.55	386.19	0.64*	0.63	4.11	0.26	386.45	0.000	24.500	385.70	386.35	0.65**	0.64	4.07	0.26	386.60	0.000	0.000	n/a	1.00	0.26
61	15	4.20	381.71	382.59	0.88*	0.92	4.57	0.32	382.91	0.600	99.568	382.31	383.19	0.88	0.92	4.57	0.33	383.51	0.602	0.601	0.598	0.50	0.16
62	15	2.87	382.41	383.35	0.94	0.68	2.91	0.28	383.62	0.000	106.170	383.78	384.46 j	0.68**	0.68	4.21	0.28	384.74	0.000	0.000	n/a	0.71	0.20
63	15	1.33	383.88	384.46	0.58	0.40	2.38	0.17	384.63	0.000	104.706	386.87	387.32 j	0.45**	0.40	3.29	0.17	387.49	0.000	0.000	n/a	1.00	n/a
64	15	2.68	376.00	379.98	1.25	1.23	2.18	0.07	380.05	0.172	60.502	379.00	380.06	1.06	1.11	2.41	0.09	380.15	0.162	0.167	0.101	0.62	0.06
65	15	1.71	379.10	380.12	1.02	0.48	1.60	0.20	380.32	0.000	177.865	383.40	383.92 j	0.52**	0.48	3.56	0.20	384.12	0.000	0.000	n/a	0.91	0.18
66	15	0.98	383.50	383.92	0.42	0.33	2.72	0.14	384.06	0.000	114.531	386.25	386.64 j	0.39**	0.33	3.01	0.14	386.78	0.000	0.000	n/a	1.00	n/a

Project File: Storm System 300.stm | Number of lines: 67 | Run Date: 11/23/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

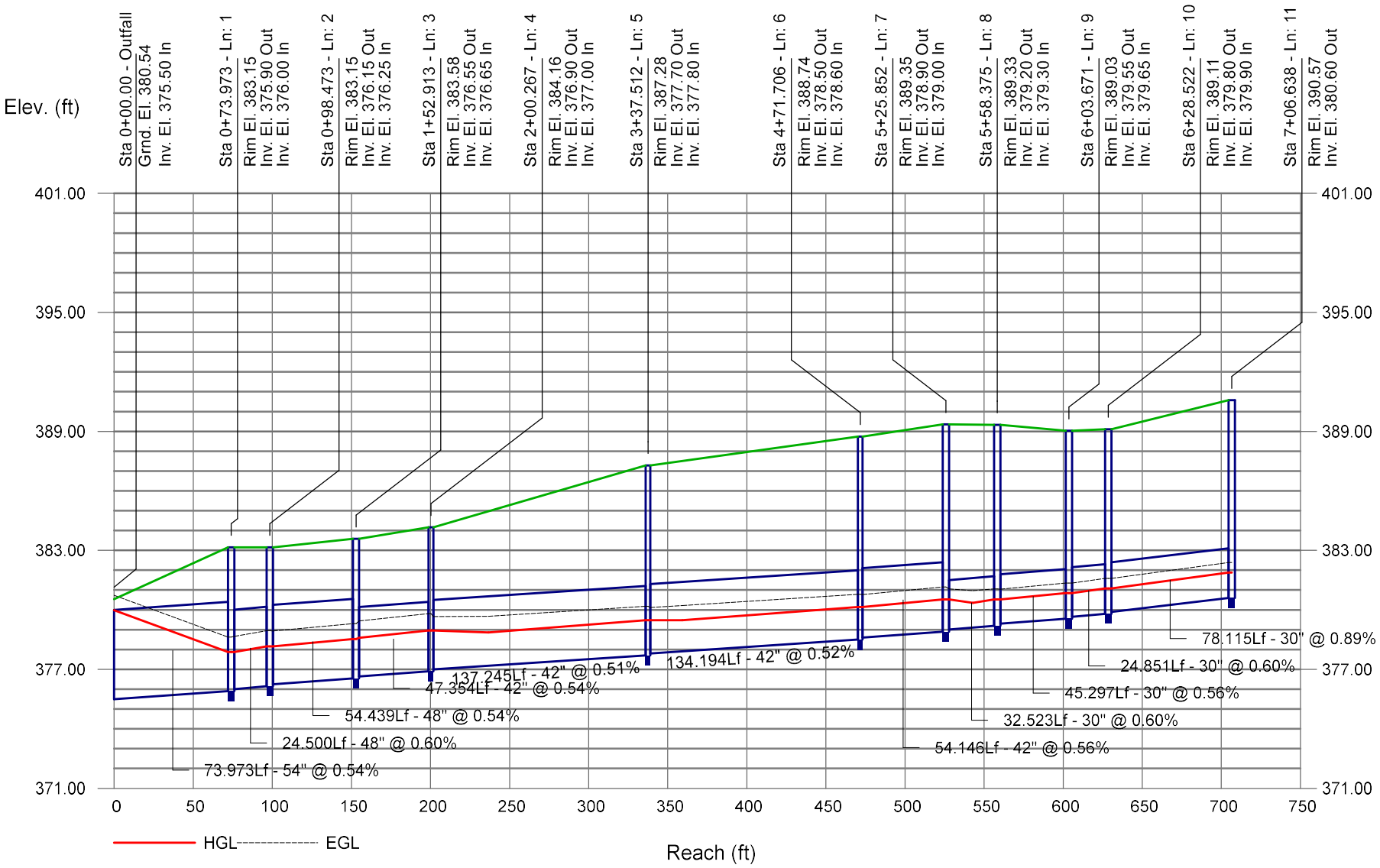
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
67	15	1.40	383.18	383.63	0.45*	0.40	3.50	0.17	383.81	0.000	28.549	383.35	383.82	0.47**	0.42	3.34	0.17	383.99	0.000	0.000	n/a	1.00	0.17

Project File: Storm System 300.stm | Number of lines: 67 | Run Date: 11/23/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

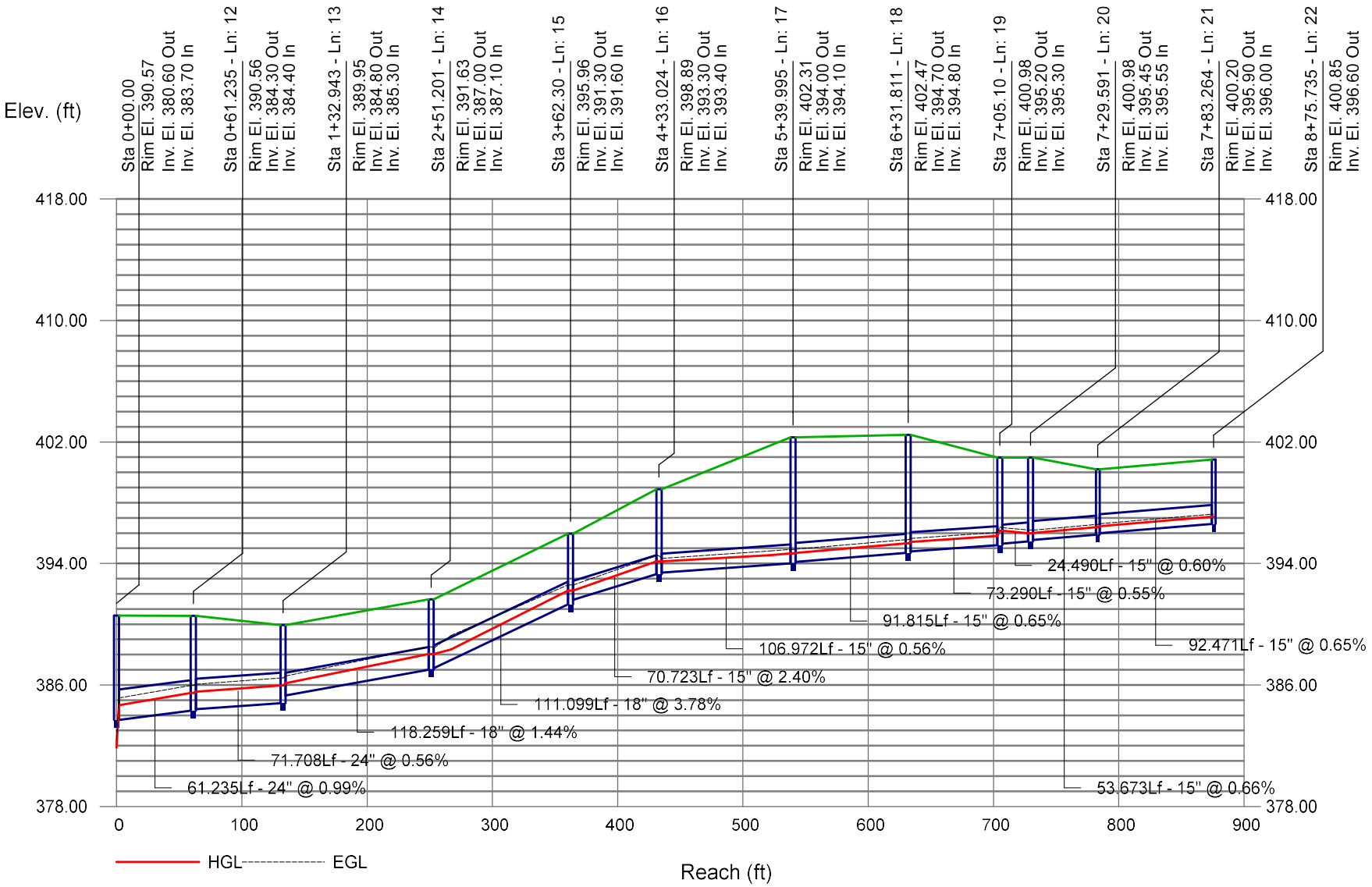
Storm Sewer Profile

Proj. file: Storm System 300.stm



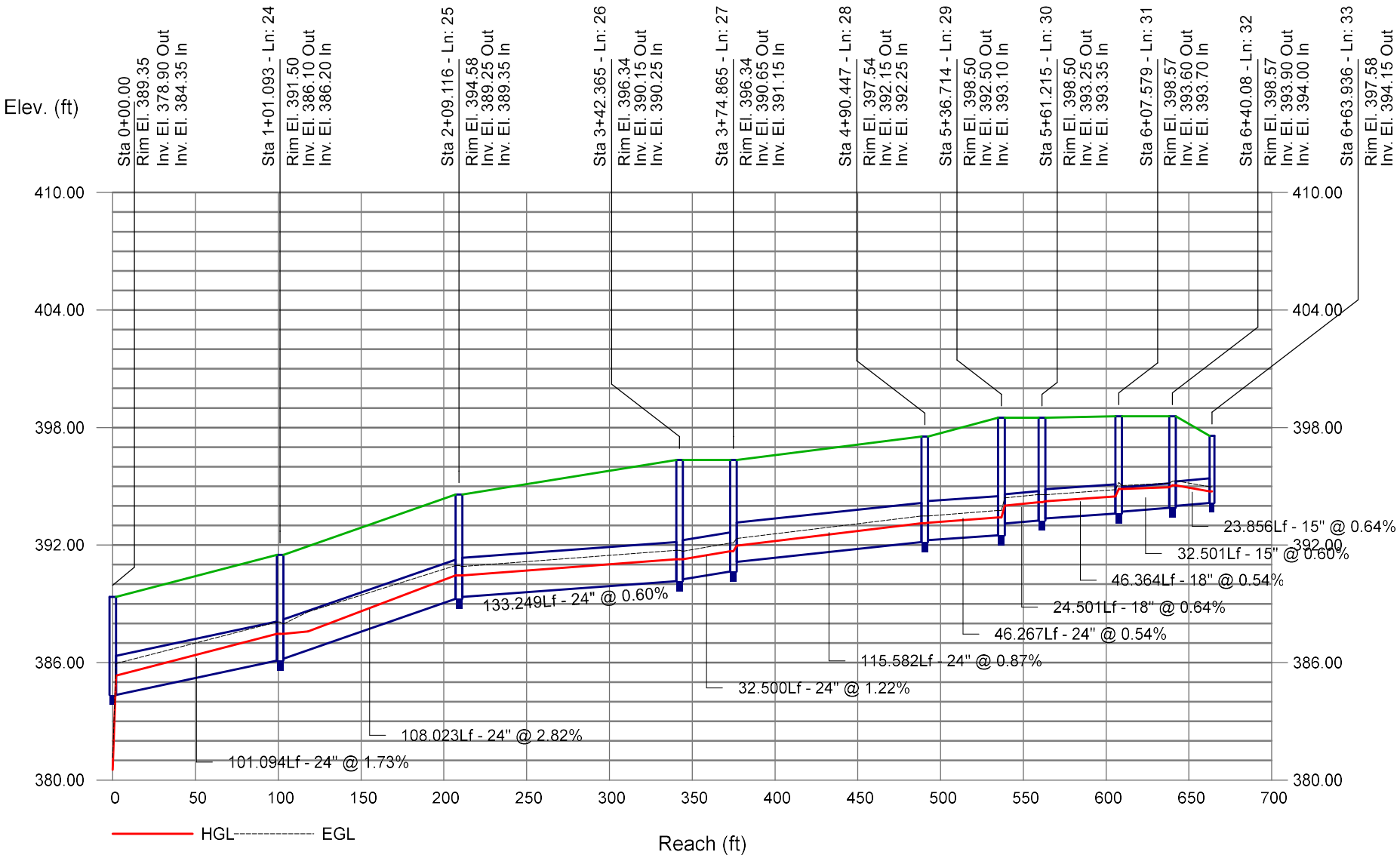
Storm Sewer Profile

Proj. file: Storm System 300.stm



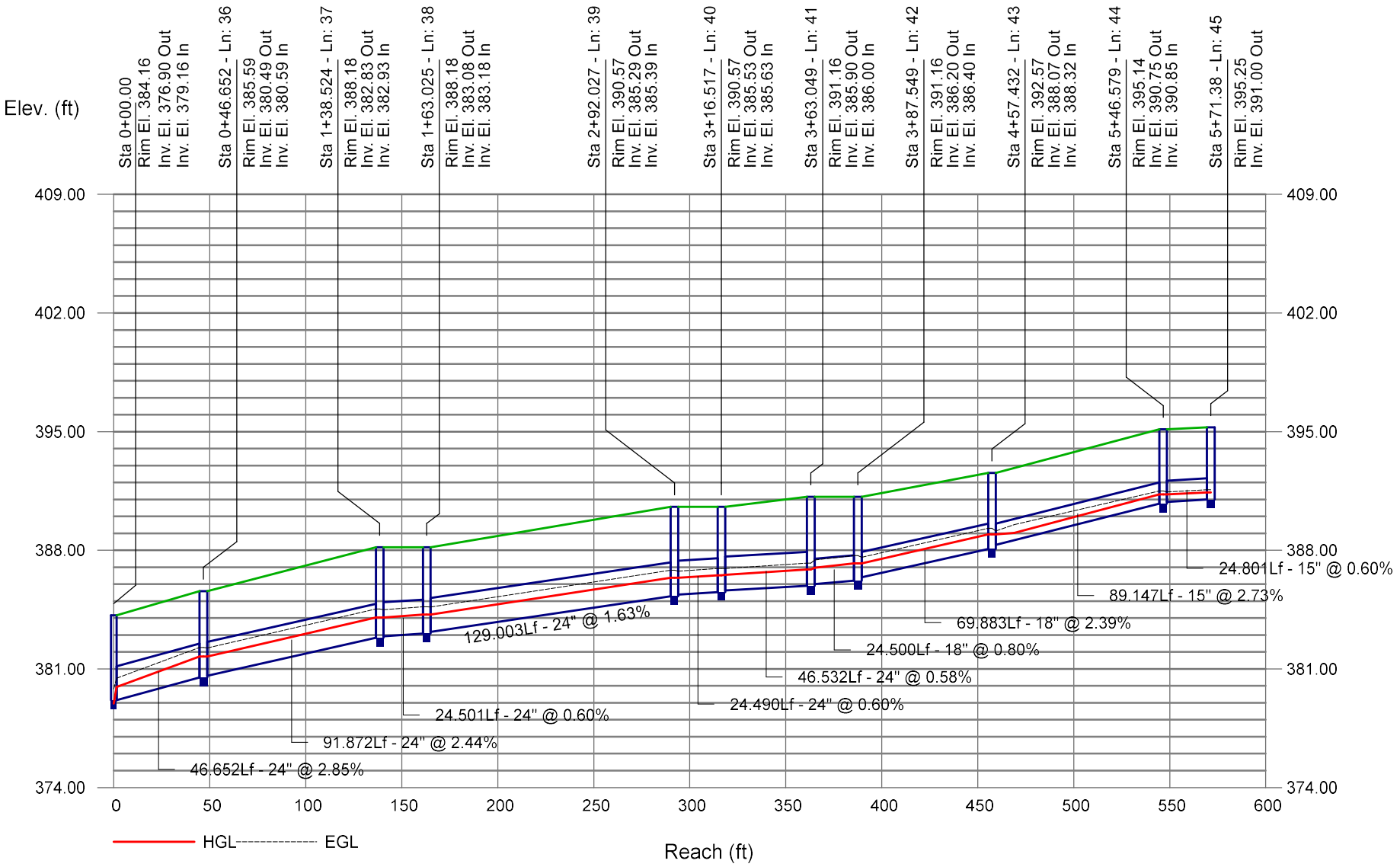
Storm Sewer Profile

Proj. file: Storm System 300.stm



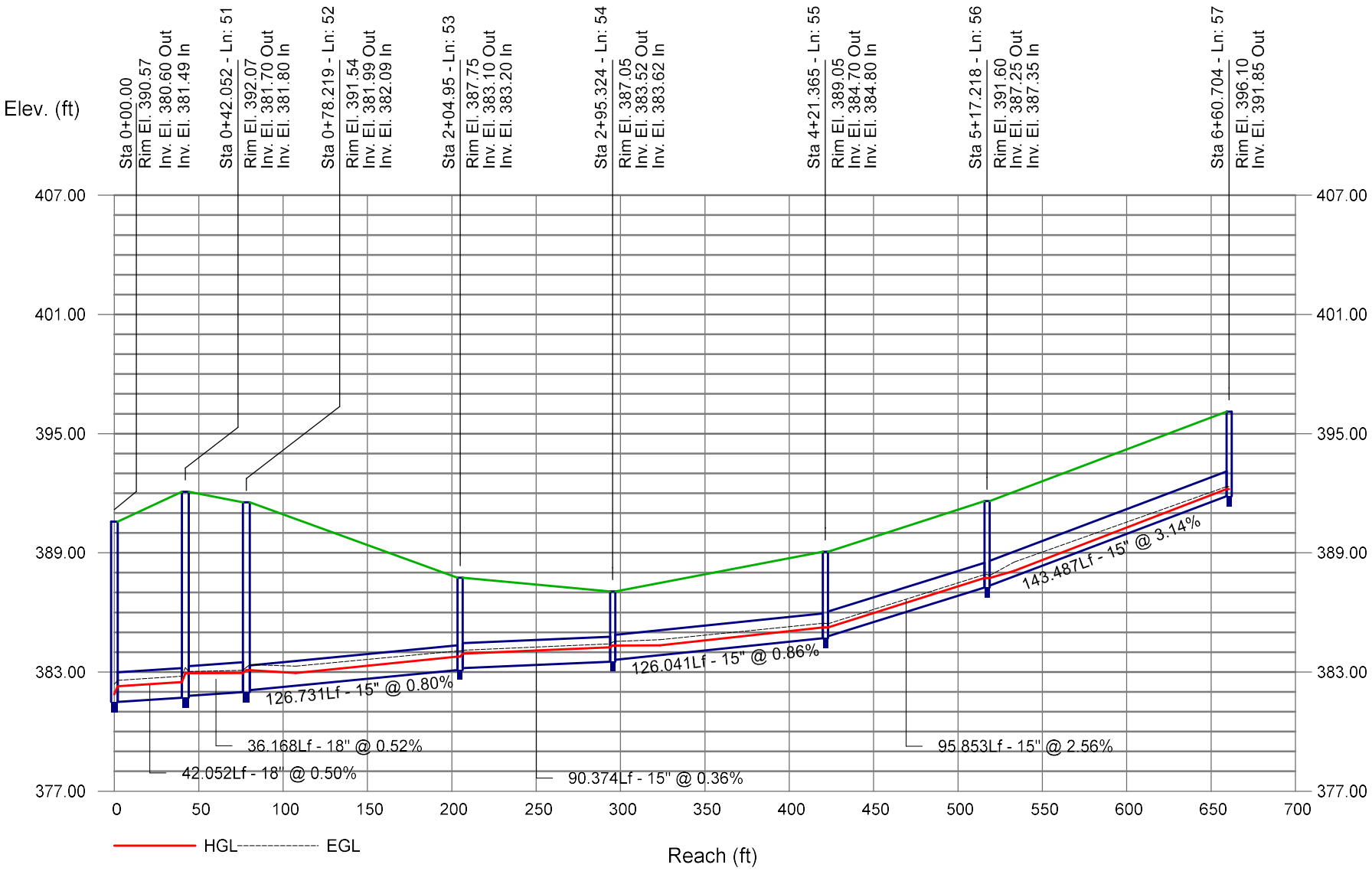
Storm Sewer Profile

Proj. file: Storm System 300.stm



Storm Sewer Profile

Proj. file: Storm System 300.stm



Storm Sewer Profile

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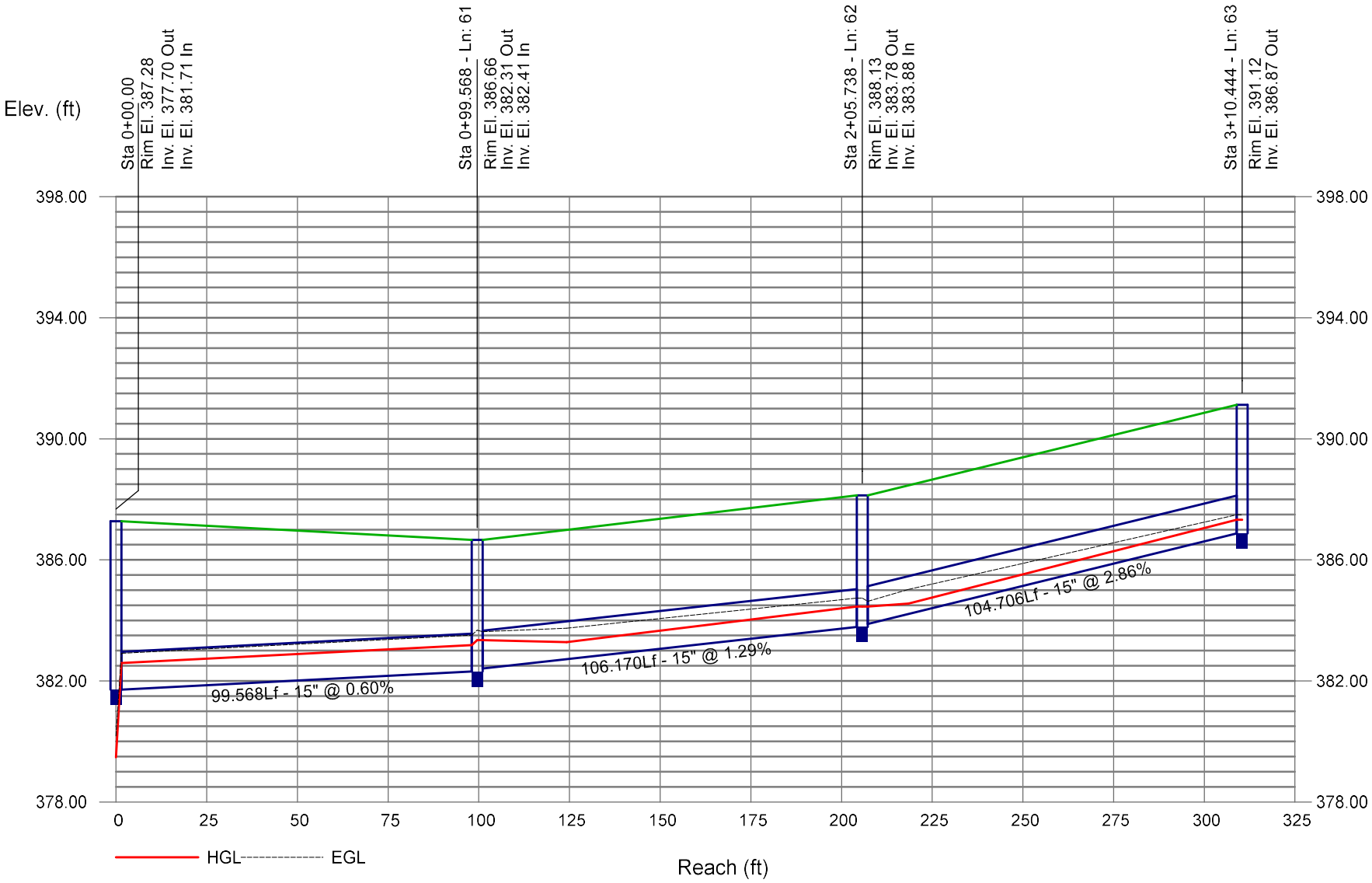

Storm Sewer Profile

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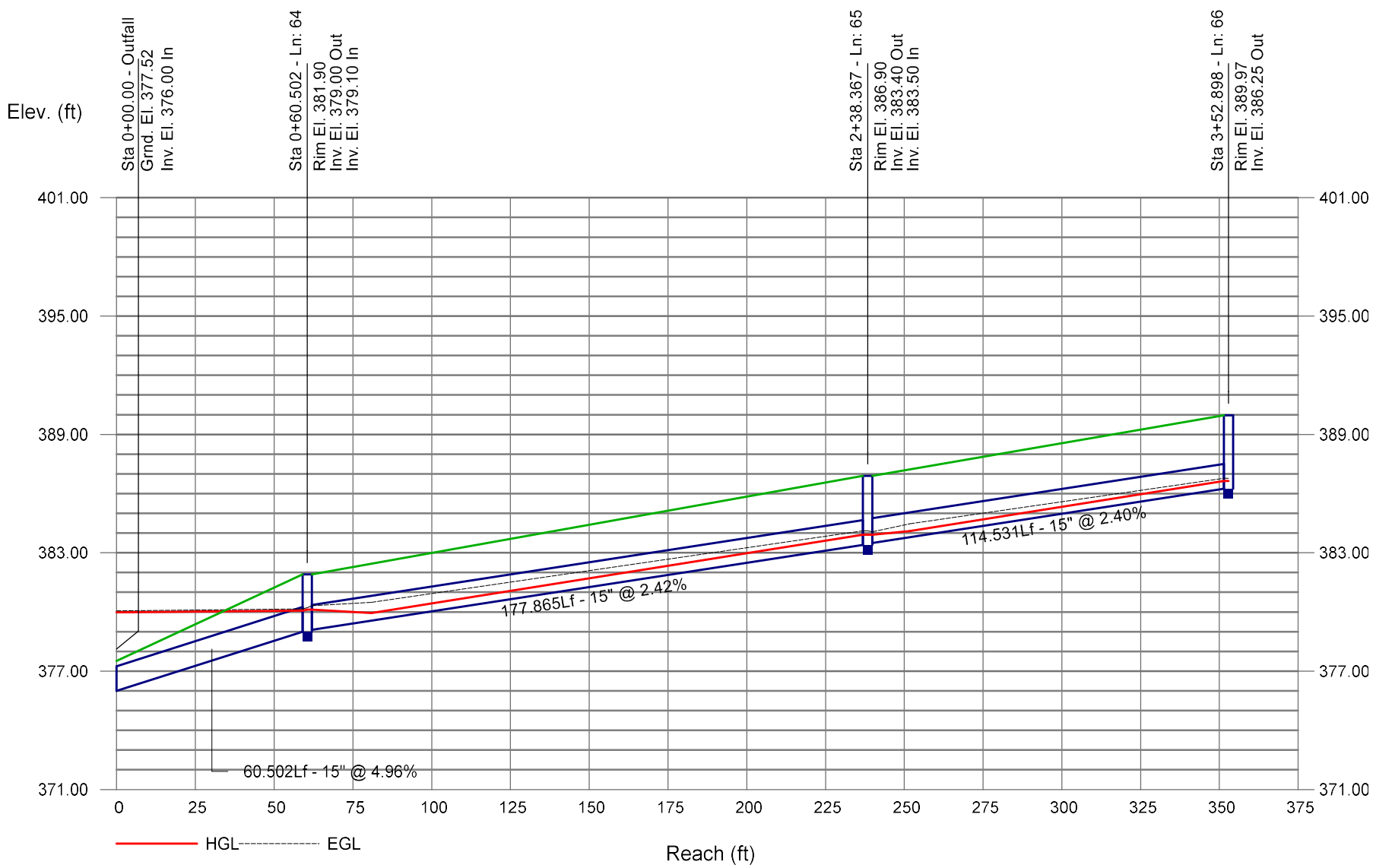
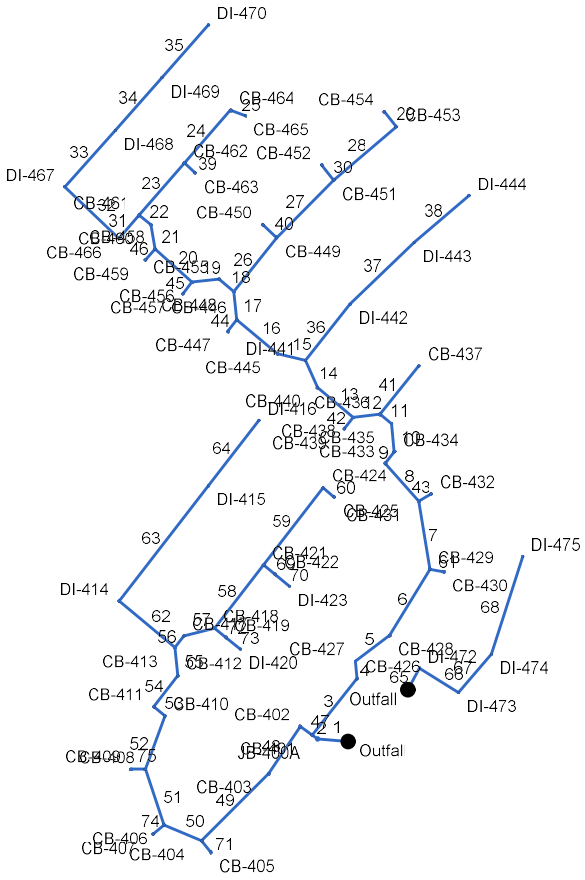


SYSTEM 400 – REPORTS AND PROFILES

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: Storm System 400.stm	Number of lines: 75	Date: 11/16/2020

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	400-400A	50.87	54	Cir	52.471	355.00	355.30	0.572	359.07	357.36	0.45	357.36	End	Manhole
2	400-401	50.26	48	Cir	11.251	355.40	355.50	0.889	357.36	357.63	1.71	357.63	1	Combination
3	401-426	29.80	42	Cir	120.147	358.30	358.95	0.542	359.84	360.63	0.74	360.63	2	Combination
4	426-427	28.71	42	Cir	28.440	359.05	359.20	0.530	360.63	360.85	0.85	360.85	3	Combination
5	427-428	28.57	42	Cir	72.220	359.30	359.70	0.558	360.85	361.35	0.41	361.35	4	Combination
6	428-429	28.21	42	Cir	128.288	359.80	360.50	0.545	361.35	362.14	0.90	362.14	5	Combination
7	429-431	27.29	42	Cir	113.212	360.60	361.20	0.529	362.14	362.81	0.89	362.81	6	Combination
8	431-433	26.65	36	Cir	84.036	361.30	361.75	0.540	362.88	363.42	n/a	363.42	7	Combination
9	433-434	26.69	36	Cir	24.500	361.85	362.00	0.601	363.42	363.67	0.76	363.67	8	Combination
10	434-435	26.31	36	Cir	46.315	362.10	362.35	0.535	363.67	364.00	0.75	364.00	9	Combination
11	435-436	25.77	36	Cir	24.500	362.45	362.60	0.600	364.00	364.23	1.00	364.23	10	Combination
12	436-438	24.35	36	Cir	46.316	362.70	362.95	0.557	364.23	364.54	n/a	364.54	11	Combination
13	438-440	24.31	36	Cir	78.000	363.05	363.50	0.574	364.54	365.09	n/a	365.09	12	Combination
14	440-441	24.40	36	Cir	48.995	363.60	363.85	0.498	365.14	365.44	0.88	365.44	13	DropGrate
15	441-445	19.15	30	Cir	48.996	363.95	364.20	0.518	365.44	365.68	0.46	365.68	14	Combination
16	445-446	18.86	30	Cir	89.000	364.30	364.80	0.566	365.71	366.27	n/a	366.27	15	Combination
17	446-448	18.30	30	Cir	46.315	364.90	365.15	0.535	366.31	366.60	n/a	366.60	16	Combination
18	448-455	10.21	24	Cir	32.500	365.25	365.45	0.600	366.60	366.59	n/a	366.59 j	17	Combination
19	455-456	9.45	24	Cir	46.316	365.55	365.80	0.557	366.62	366.90	0.75	366.90	18	Combination
20	456-458	9.17	24	Cir	83.149	365.90	366.35	0.540	366.97	367.43	0.65	367.43	19	Combination
21	458-460	8.99	24	Cir	40.491	366.45	366.70	0.600	367.47	367.77	0.46	367.77	20	Combination
22	460-461	8.19	24	Cir	25.247	366.80	366.95	0.600	367.77	367.97	0.91	367.97	21	Combination
23	461-462	5.10	15	Cir	115.192	373.58	378.75	4.491	374.11	379.67	n/a	379.67	22	Combination
24	462-464	2.99	15	Cir	116.558	379.00	384.35	4.590	379.67	385.05	n/a	385.05	23	Combination

Project File: Storm System 400.stm | Number of lines: 75 | Run Date: 11/16/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	464-465	1.41	15	Cir	26.466	384.45	384.95	1.889	385.05	385.42	n/a	385.42 j	24	Combination
26	448-449	8.73	18	Cir	114.575	373.70	377.10	2.963	374.44	378.24	0.85	378.24	17	Combination
27	449-451	5.93	18	Cir	135.495	377.20	379.80	1.915	378.24	380.73	n/a	380.73 j	26	Combination
28	451-453	2.82	15	Cir	138.075	380.20	382.45	1.626	380.73	383.12	n/a	383.12	27	Combination
29	453-454	1.65	15	Cir	32.501	382.55	382.75	0.631	383.12	383.26	n/a	383.26 j	28	Combination
30	451-452	1.79	15	Cir	32.501	380.03	380.22	0.600	380.73	380.75	0.20	380.75	27	Combination
31	461-466	3.21	15	Cir	51.780	367.20	367.50	0.581	367.97	368.22	0.44	368.67	22	Combination
32	466-467	2.89	15	Cir	125.192	367.60	368.35	0.600	368.67	369.03	0.41	369.03	31	DropGrate
33	467-468	2.12	15	Cir	126.727	368.45	374.15	4.498	369.03	374.73	n/a	374.73 j	32	DropGrate
34	468-469	1.56	15	Cir	117.006	374.25	379.65	4.615	374.73	380.14	0.09	380.14	33	DropGrate
35	469-470	0.95	15	Cir	117.502	379.75	384.75	4.255	380.14	385.13	n/a	385.13 j	34	DropGrate
36	441-442	4.50	15	Cir	119.484	374.90	376.60	1.423	375.59	377.46	0.19	377.46	14	DropGrate
37	442-443	2.93	15	Cir	149.208	376.70	379.30	1.743	377.46	379.99	n/a	379.99 j	36	DropGrate
38	443-444	0.93	15	Cir	121.017	379.40	381.70	1.901	379.99	382.08	n/a	382.08 j	37	DropGrate
39	462-463	1.22	15	Cir	24.500	378.85	379.00	0.600	379.67	379.44	0.16	379.44	23	Combination
40	449-450	1.61	15	Cir	32.503	377.36	377.55	0.600	378.24	378.05	n/a	378.05	26	Combination
41	436-437	0.96	15	Cir	103.397	376.71	378.94	2.157	376.98	379.32	0.14	379.32	11	Combination
42	438-439	0.16	15	Cir	24.500	375.34	375.49	0.600	375.49	375.64	0.05	375.64	12	Combination
43	431-432	0.83	15	Cir	24.498	373.20	373.35	0.600	373.55	373.71	n/a	373.71	7	Combination
44	446-447	0.50	15	Cir	24.500	372.54	372.69	0.600	372.81	372.97	n/a	372.97	16	Combination
45	456-457	0.27	15	Cir	24.500	372.44	372.59	0.600	372.64	372.79	0.07	372.79	19	Combination
46	458-459	0.16	15	Cir	24.500	372.22	372.37	0.600	372.38	372.52	n/a	372.52	20	Combination
47	401-402	22.96	42	Cir	24.500	355.60	355.75	0.600	357.63	357.22	0.84	357.22	2	Combination
48	402-403	21.71	36	Cir	93.959	355.85	356.35	0.536	357.25	357.85	n/a	357.85	47	Combination

Project File: Storm System 400.stm | Number of lines: 75 | Run Date: 11/16/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
49	403-404	21.62	36	Cir	159.199	356.45	357.25	0.506	357.87	358.74	0.88	358.74	48	Combination
50	404-406	20.77	30	Cir	68.716	357.35	357.70	0.513	358.90	359.26	n/a	360.14 j	49	Combination
51	406-408	20.51	30	Cir	96.731	357.80	358.30	0.517	360.14	359.84	n/a	359.84	50	Combination
52	408-410	17.38	30	Cir	93.254	358.40	358.90	0.539	359.84	360.31	n/a	360.31 j	51	Combination
53	410-411	15.94	30	Cir	24.500	359.00	359.15	0.600	360.31	360.50	n/a	360.50	52	Combination
54	411-412	15.53	30	Cir	65.109	359.25	359.60	0.537	360.52	360.93	0.60	360.93	53	Combination
55	412-413	14.87	30	Cir	46.337	359.70	359.95	0.536	360.94	361.25	n/a	361.25	54	Combination
56	413-417	9.05	24	Cir	24.500	360.05	360.20	0.600	361.25	361.27	n/a	361.27	55	Combination
57	417-418	8.82	24	Cir	53.921	360.15	360.45	0.563	361.27	361.51	0.53	361.51	56	Combination
58	418-421	5.92	18	Cir	133.468	361.05	363.75	2.024	361.71	364.69	n/a	364.69	57	Combination
59	421-424	1.64	15	Cir	161.703	365.00	371.20	3.836	365.30	371.71	n/a	371.71	58	Combination
60	424-425	0.74	15	Cir	24.500	371.30	371.45	0.600	371.71	371.79	n/a	371.79 j	59	Combination
61	429-430	1.51	15	Cir	24.506	370.15	370.30	0.600	370.62	370.79	0.18	370.79	6	Combination
62	413-414	6.03	18	Cir	121.968	360.45	361.65	0.983	361.27	362.60	n/a	362.60	55	DropGrate
63	414-415	2.96	15	Cir	242.563	361.95	368.83	2.836	362.60	369.52	n/a	369.52	62	DropGrate
64	415-416	1.06	15	Cir	137.194	368.93	372.86	2.865	369.52	373.26	n/a	373.26 j	63	DropGrate
65	471-472	3.63	15	Cir	40.184	355.00	359.00	9.963	359.07	359.77	n/a	359.77 j	End	DropGrate
66	472-473	3.53	15	Cir	77.647	361.50	364.05	3.280	361.97	364.81	0.47	364.81	65	DropGrate
67	473-474	3.09	15	Cir	84.085	364.15	365.60	1.724	364.81	366.31	0.19	366.31	66	DropGrate
68	474-475	2.14	15	Cir	168.625	365.70	368.50	1.660	366.31	369.08	n/a	369.08 j	67	DropGrate
69	421-422	3.15	15	Cir	24.500	363.85	364.00	0.600	364.69	364.73	0.14	364.87	58	Combination
70	422-423	2.25	15	Cir	31.939	364.10	364.30	0.631	364.87	364.90	n/a	364.90	69	DropGrate
71	404-405	0.31	15	Cir	24.500	361.90	362.05	0.600	362.11	362.26	0.07	362.26	49	Combination
72	418-419	1.98	18	Cir	24.500	360.55	360.70	0.600	361.51	361.23	0.10	361.23	57	Combination

Project File: Storm System 400.stm | Number of lines: 75 | Run Date: 11/16/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
73	419-420	1.54	15	Cir	30.685	360.80	361.00	0.666	361.26	361.49	0.18	361.49	72	DropGrate
74	406-407	0.18	15	Cir	24.500	359.25	359.40	0.600	360.14	359.56	n/a	359.56	50	Combination
75	408-409	3.27	15	Cir	24.498	360.50	360.65	0.600	361.24	361.39	n/a	361.68 j	51	Combination

Project File: Storm System 400.stm | Number of lines: 75 | Run Date: 11/16/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	52.471	0.17	15.19	0.84	0.14	10.81	5.0	17.0	4.7	50.87	148.8	5.26	54	0.57	355.00	355.30	359.07	357.36	360.04	366.46	400-400A
2	1	11.251	0.17	15.02	0.84	0.14	10.66	5.0	17.0	4.7	50.26	135.4	7.80	48	0.89	355.40	355.50	357.36	357.63	366.46	366.26	400-401
3	2	120.147	0.35	8.78	0.72	0.25	6.22	5.0	16.3	4.8	29.80	74.04	6.89	42	0.54	358.30	358.95	359.84	360.63	366.26	367.60	401-426
4	3	28.440	0.13	8.43	0.71	0.09	5.96	5.0	16.2	4.8	28.71	73.21	6.60	42	0.53	359.05	359.20	360.63	360.85	367.60	367.94	426-427
5	4	72.220	0.26	8.30	0.72	0.19	5.87	5.0	15.8	4.9	28.57	75.17	6.67	42	0.56	359.30	359.70	360.85	361.35	367.94	370.07	427-428
6	5	128.288	0.11	8.04	0.68	0.07	5.69	5.0	15.1	5.0	28.21	74.30	6.63	42	0.55	359.80	360.50	361.35	362.14	370.07	374.55	428-429
7	6	113.212	0.10	7.63	0.65	0.07	5.40	5.0	14.5	5.1	27.29	73.19	6.52	42	0.53	360.60	361.20	362.14	362.81	374.55	377.62	429-431
8	7	84.036	0.01	7.37	0.90	0.01	5.22	5.0	14.2	5.1	26.65	49.03	6.84	36	0.54	361.30	361.75	362.88	363.42	377.62	378.95	431-433
9	8	24.500	0.12	7.36	0.86	0.10	5.21	5.0	14.1	5.1	26.69	51.68	6.88	36	0.60	361.85	362.00	363.42	363.67	378.95	378.95	433-434
10	9	46.315	0.15	7.24	0.80	0.12	5.11	5.0	13.9	5.2	26.31	48.78	6.81	36	0.54	362.10	362.35	363.67	364.00	378.95	380.96	434-435
11	10	24.500	0.24	7.09	0.72	0.17	4.99	5.0	13.8	5.2	25.77	51.66	6.75	36	0.60	362.45	362.60	364.00	364.23	380.96	380.96	435-436
12	11	46.316	0.05	6.66	0.72	0.04	4.68	5.0	13.6	5.2	24.35	49.77	6.54	36	0.56	362.70	362.95	364.23	364.54	380.96	379.74	436-438
13	12	78.000	0.02	6.58	0.72	0.01	4.62	5.0	13.2	5.3	24.31	50.55	6.67	36	0.57	363.05	363.50	364.54	365.09	379.74	379.92	438-440
14	13	48.995	0.40	6.56	0.71	0.28	4.61	5.0	13.0	5.3	24.40	47.06	6.56	36	0.50	363.60	363.85	365.14	365.44	379.92	379.14	440-441
15	14	48.996	0.12	5.08	0.78	0.09	3.60	5.0	12.8	5.3	19.15	29.53	6.29	30	0.52	363.95	364.20	365.44	365.68	379.14	378.52	441-445
16	15	89.000	0.07	4.96	0.79	0.06	3.50	5.0	12.5	5.4	18.86	30.86	6.44	30	0.57	364.30	364.80	365.71	366.27	378.52	376.94	445-446
17	16	46.315	0.24	4.80	0.72	0.17	3.38	5.0	12.3	5.4	18.30	30.00	6.31	30	0.54	364.90	365.15	366.31	366.60	376.94	378.24	446-448
18	17	32.500	0.21	2.70	0.72	0.15	1.87	5.0	12.1	5.4	10.21	17.52	5.02	24	0.60	365.25	365.45	366.60	366.59	378.24	378.24	448-455
19	18	46.316	0.05	2.49	0.75	0.04	1.72	5.0	11.9	5.5	9.45	16.88	5.44	24	0.56	365.55	365.80	366.62	366.90	378.24	376.84	455-456
20	19	83.149	0.03	2.39	0.75	0.02	1.65	5.0	11.5	5.6	9.17	16.62	5.36	24	0.54	365.90	366.35	366.97	367.43	376.84	376.62	456-458
21	20	40.491	0.21	2.33	0.71	0.15	1.60	5.0	11.3	5.6	8.99	17.52	5.43	24	0.60	366.45	366.70	367.47	367.77	376.62	377.87	458-460
22	21	25.247	0.20	2.12	0.71	0.14	1.45	5.0	11.1	5.6	8.19	17.52	5.26	24	0.60	366.80	366.95	367.77	367.97	377.87	377.83	460-461

Project File: Storm System 400.stm

Number of lines: 75

Run Date: 11/16/2020

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Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	22	115.192	0.22	1.07	0.70	0.15	0.75	5.0	6.2	6.8	5.10	13.68	7.82	15	4.49	373.58	378.75	374.11	379.67	377.83	383.25	461-462
24	23	116.558	0.33	0.61	0.69	0.23	0.42	5.0	5.4	7.1	2.99	13.83	4.38	15	4.59	379.00	384.35	379.67	385.05	383.25	388.73	462-464
25	24	26.466	0.28	0.28	0.70	0.20	0.20	5.0	5.0	7.2	1.41	8.88	2.90	15	1.89	384.45	384.95	385.05	385.42	388.73	389.20	464-465
26	17	114.575	0.32	1.86	0.71	0.23	1.33	5.0	7.1	6.6	8.73	18.08	8.09	18	2.96	373.70	377.10	374.44	378.24	378.24	381.80	448-449
27	26	135.495	0.33	1.22	0.70	0.23	0.88	5.0	6.4	6.8	5.93	14.53	4.82	18	1.92	377.20	379.80	378.24	380.73	381.80	384.47	449-451
28	27	138.075	0.24	0.53	0.71	0.17	0.40	5.0	5.4	7.1	2.82	8.23	4.90	15	1.63	380.20	382.45	380.73	383.12	384.47	387.02	451-453
29	28	32.501	0.29	0.29	0.79	0.23	0.23	5.0	5.0	7.2	1.65	5.13	3.25	15	0.63	382.55	382.75	383.12	383.26	387.02	387.01	453-454
30	27	32.501	0.36	0.36	0.69	0.25	0.25	5.0	5.0	7.2	1.79	5.00	3.04	15	0.60	380.03	380.22	380.73	380.75	384.47	384.47	451-452
31	22	51.780	0.10	0.85	0.71	0.07	0.56	5.0	10.8	5.7	3.21	4.92	4.21	15	0.58	367.20	367.50	367.97	368.22	377.83	375.63	461-466
32	31	125.192	0.22	0.75	0.66	0.15	0.49	5.0	10.0	5.8	2.89	5.00	3.40	15	0.60	367.60	368.35	368.67	369.03	375.63	372.70	466-467
33	32	126.727	0.16	0.53	0.66	0.11	0.35	5.0	8.9	6.1	2.12	13.70	3.79	15	4.50	368.45	374.15	369.03	374.73	372.70	378.50	467-468
34	33	117.006	0.17	0.37	0.65	0.11	0.24	5.0	7.5	6.4	1.56	13.87	3.52	15	4.62	374.25	379.65	374.73	380.14	378.50	384.00	468-469
35	34	117.502	0.20	0.20	0.66	0.13	0.13	5.0	5.0	7.2	0.95	13.32	2.92	15	4.26	379.75	384.75	380.14	385.13	384.00	389.00	469-470
36	14	119.484	0.40	1.08	0.68	0.27	0.73	5.0	8.6	6.2	4.50	7.70	5.76	15	1.42	374.90	376.60	375.59	377.46	379.14	380.95	441-442
37	36	149.208	0.49	0.68	0.67	0.33	0.46	5.0	7.7	6.4	2.93	8.52	4.00	15	1.74	376.70	379.30	377.46	379.99	380.95	383.66	442-443
38	37	121.017	0.19	0.19	0.68	0.13	0.13	5.0	5.0	7.2	0.93	8.90	2.30	15	1.90	379.40	381.70	379.99	382.08	383.66	385.95	443-444
39	23	24.500	0.24	0.24	0.71	0.17	0.17	5.0	5.0	7.2	1.22	5.00	2.33	15	0.60	378.85	379.00	379.67	379.44	383.25	383.25	462-463
40	26	32.503	0.32	0.32	0.70	0.22	0.22	5.0	5.0	7.2	1.61	5.00	2.61	15	0.60	377.36	377.55	378.24	378.05	381.80	381.80	449-450
41	11	103.397	0.19	0.19	0.70	0.13	0.13	5.0	5.0	7.2	0.96	9.48	3.97	15	2.16	376.71	378.94	376.98	379.32	380.96	383.19	436-437
42	12	24.500	0.03	0.03	0.72	0.02	0.02	5.0	5.0	7.2	0.16	5.00	1.84	15	0.60	375.34	375.49	375.49	375.64	379.74	379.74	438-439
43	7	24.498	0.16	0.16	0.72	0.12	0.12	5.0	5.0	7.2	0.83	5.00	2.94	15	0.60	373.20	373.35	373.55	373.71	377.62	377.62	431-432
44	16	24.500	0.09	0.09	0.78	0.07	0.07	5.0	5.0	7.2	0.50	5.00	2.56	15	0.60	372.54	372.69	372.81	372.97	376.94	376.94	446-447

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Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
45	19	24.500	0.05	0.05	0.75	0.04	0.04	5.0	5.0	7.2	0.27	5.00	2.14	15	0.60	372.44	372.59	372.64	372.79	376.84	376.84	456-457
46	20	24.500	0.03	0.03	0.75	0.02	0.02	5.0	5.0	7.2	0.16	5.00	1.86	15	0.60	372.22	372.37	372.38	372.52	376.62	376.62	458-459
47	2	24.500	0.44	6.07	0.68	0.30	4.30	5.0	12.8	5.3	22.96	77.93	4.99	42	0.60	355.60	355.75	357.63	357.22	366.26	366.26	401-402
48	47	93.959	0.18	5.63	0.69	0.12	4.01	5.0	12.3	5.4	21.71	48.83	6.43	36	0.54	355.85	356.35	357.25	357.85	366.26	366.97	402-403
49	48	159.199	0.20	5.45	0.71	0.14	3.88	5.0	11.5	5.6	21.62	47.43	6.35	36	0.51	356.45	357.25	357.87	358.74	366.97	366.28	403-404
50	49	68.716	0.09	5.20	0.73	0.07	3.70	5.0	11.2	5.6	20.77	29.36	6.48	30	0.51	357.35	357.70	358.90	359.26	366.28	363.98	404-406
51	50	96.731	0.17	5.08	0.82	0.14	3.61	5.0	10.8	5.7	20.51	29.49	5.39	30	0.52	357.80	358.30	360.14	359.84	363.98	364.84	406-408
52	51	93.254	0.40	4.24	0.65	0.26	3.01	5.0	10.4	5.8	17.38	30.12	6.02	30	0.54	358.40	358.90	359.84	360.31	364.84	365.87	408-410
53	52	24.500	0.13	3.84	0.78	0.10	2.75	5.0	10.3	5.8	15.94	31.76	6.02	30	0.60	359.00	359.15	360.31	360.50	365.87	365.87	410-411
54	53	65.109	0.17	3.71	0.79	0.13	2.65	5.0	10.0	5.9	15.53	30.06	6.02	30	0.54	359.25	359.60	360.52	360.93	365.87	366.52	411-412
55	54	46.337	0.07	3.54	0.75	0.05	2.52	5.0	9.8	5.9	14.87	30.02	5.94	30	0.54	359.70	359.95	360.94	361.25	366.52	366.44	412-413
56	55	24.500	0.07	2.02	0.75	0.05	1.46	5.0	8.6	6.2	9.05	17.52	4.94	24	0.60	360.05	360.20	361.25	361.27	366.44	366.44	413-417
57	56	53.921	0.29	1.95	0.71	0.21	1.41	5.0	8.3	6.3	8.82	16.97	5.04	24	0.56	360.15	360.45	361.27	361.51	366.44	367.52	417-418
58	57	133.468	0.35	1.27	0.70	0.25	0.92	5.0	7.6	6.4	5.92	14.94	6.53	18	2.02	361.05	363.75	361.71	364.69	367.52	369.60	418-421
59	58	161.703	0.17	0.30	0.78	0.13	0.24	5.0	5.7	7.0	1.64	12.65	5.30	15	3.84	365.00	371.20	365.30	371.71	369.60	375.71	421-424
60	59	24.500	0.13	0.13	0.79	0.10	0.10	5.0	5.0	7.2	0.74	5.00	2.45	15	0.60	371.30	371.45	371.71	371.79	375.71	375.71	424-425
61	6	24.506	0.30	0.30	0.70	0.21	0.21	5.0	5.0	7.2	1.51	5.00	3.49	15	0.60	370.15	370.30	370.62	370.79	374.55	374.55	429-430
62	55	121.968	0.79	1.45	0.68	0.54	1.00	5.0	9.2	6.0	6.03	10.41	5.62	18	0.98	360.45	361.65	361.27	362.60	366.44	366.12	413-414
63	62	242.563	0.45	0.66	0.70	0.32	0.46	5.0	7.7	6.4	2.96	10.88	4.43	15	2.84	361.95	368.83	362.60	369.52	366.12	373.18	414-415
64	63	137.194	0.21	0.21	0.70	0.15	0.15	5.0	5.0	7.2	1.06	10.93	2.46	15	2.86	368.93	372.86	369.52	373.26	373.18	377.11	415-416
65	End	40.184	0.04	0.90	0.62	0.02	0.57	5.0	7.6	6.4	3.63	20.38	3.77	15	9.96	355.00	359.00	359.07	359.77	356.52	365.24	471-472
66	65	77.647	0.12	0.86	0.66	0.08	0.54	5.0	7.2	6.5	3.53	11.69	6.44	15	3.28	361.50	364.05	361.97	364.81	365.24	367.90	472-473

Project File: Storm System 400.stm

Number of lines: 75

Run Date: 11/16/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
67	66	84.085	0.26	0.74	0.63	0.16	0.46	5.0	6.6	6.7	3.09	8.48	4.51	15	1.72	364.15	365.60	364.81	366.31	367.90	369.45	473-474
68	67	168.625	0.48	0.48	0.62	0.30	0.30	5.0	5.0	7.2	2.14	8.32	3.72	15	1.66	365.70	368.50	366.31	369.08	369.45	372.25	474-475
69	58	24.500	0.16	0.62	0.82	0.13	0.44	5.0	5.3	7.1	3.15	5.00	3.90	15	0.60	363.85	364.00	364.69	364.73	369.60	369.60	421-422
70	69	31.939	0.46	0.46	0.68	0.31	0.31	5.0	5.0	7.2	2.25	5.13	3.35	15	0.63	364.10	364.30	364.87	364.90	369.60	367.13	422-423
71	49	24.500	0.05	0.05	0.85	0.04	0.04	5.0	5.0	7.2	0.31	5.00	2.22	15	0.60	361.90	362.05	362.11	362.26	366.28	366.28	404-405
72	57	24.500	0.08	0.39	0.84	0.07	0.28	5.0	5.4	7.1	1.98	8.13	2.61	18	0.60	360.55	360.70	361.51	361.23	367.52	367.52	418-419
73	72	30.685	0.31	0.31	0.69	0.21	0.21	5.0	5.0	7.2	1.54	5.27	3.58	15	0.67	360.80	361.00	361.26	361.49	367.52	364.63	419-420
74	50	24.500	0.03	0.03	0.82	0.02	0.02	5.0	5.0	7.2	0.18	5.00	1.04	15	0.60	359.25	359.40	360.14	359.56	363.98	363.98	406-407
75	51	24.498	0.67	0.67	0.68	0.46	0.46	5.0	5.0	7.2	3.27	5.00	4.34	15	0.60	360.50	360.65	361.24	361.39	364.84	364.84	408-409

Project File: Storm System 400.stm

Number of lines: 75

Run Date: 11/16/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	54	50.87	355.00	359.07	4.07	7.11	3.36	0.80	359.87	0.000	52.471	355.30	357.36	2.06**	7.11	7.15	0.80	358.16	0.000	0.000	n/a	0.57	0.45
2	48	50.26	355.40	357.36	1.96	6.14	8.19	0.85	358.22	0.000	11.251	355.50	357.63	2.13**	6.78	7.41	0.85	358.48	0.000	0.000	n/a	2.00	1.71
3	42	29.80	358.30	359.84	1.55*	4.10	7.28	0.66	360.50	0.000	120.147	358.95	360.63	1.68**	4.58	6.50	0.66	361.29	0.000	0.000	n/a	1.13	0.74
4	42	28.71	359.05	360.63	1.58	4.23	6.78	0.64	361.27	0.000	28.440	359.20	360.85	1.65**	4.47	6.42	0.64	361.49	0.000	0.000	n/a	1.33	0.85
5	42	28.57	359.30	360.85	1.55	4.12	6.93	0.64	361.49	0.000	72.220	359.70	361.35	1.65**	4.45	6.41	0.64	361.99	0.000	0.000	n/a	0.64	0.41
6	42	28.21	359.80	361.35	1.55	4.10	6.87	0.63	361.98	0.000	128.288	360.50	362.14	1.64**	4.41	6.39	0.63	362.77	0.000	0.000	n/a	1.41	0.90
7	42	27.29	360.60	362.14	1.54	4.07	6.71	0.62	362.76	0.000	113.212	361.20	362.81	1.61**	4.32	6.32	0.62	363.43	0.000	0.000	n/a	1.43	0.89
8	36	26.65	361.30	362.88	1.58*	3.76	7.08	0.68	363.56	0.000	84.036	361.75	363.42	1.67**	4.03	6.61	0.68	364.10	0.000	0.000	n/a	1.49	n/a
9	36	26.69	361.85	363.42	1.57	3.73	7.15	0.68	364.10	0.000	24.500	362.00	363.67	1.67**	4.04	6.61	0.68	364.35	0.000	0.000	n/a	1.12	0.76
10	36	26.31	362.10	363.67	1.57*	3.74	7.03	0.67	364.34	0.000	46.315	362.35	364.00	1.66**	4.00	6.58	0.67	364.68	0.000	0.000	n/a	1.12	0.75
11	36	25.77	362.45	364.00	1.56	3.70	6.97	0.66	364.67	0.000	24.500	362.60	364.23	1.64**	3.95	6.53	0.66	364.90	0.000	0.000	n/a	1.50	1.00
12	36	24.35	362.70	364.23	1.54	3.65	6.68	0.64	364.87	0.000	46.316	362.95	364.54	1.59**	3.80	6.40	0.64	365.18	0.000	0.000	n/a	1.13	n/a
13	36	24.31	363.05	364.54	1.49	3.50	6.94	0.64	365.18	0.000	78.000	363.50	365.09	1.59**	3.80	6.40	0.64	365.73	0.000	0.000	n/a	0.74	n/a
14	36	24.40	363.60	365.14	1.53*	3.63	6.71	0.64	365.77	0.000	48.995	363.85	365.44	1.59**	3.81	6.41	0.64	366.08	0.000	0.000	n/a	1.38	0.88
15	30	19.15	363.95	365.44	1.49	3.03	6.27	0.62	366.06	0.000	48.996	364.20	365.68	1.48**	3.03	6.32	0.62	366.30	0.000	0.000	n/a	0.74	0.46
16	30	18.86	364.30	365.71	1.41*	2.86	6.60	0.61	366.33	0.000	89.000	364.80	366.27	1.47**	3.00	6.28	0.61	366.89	0.000	0.000	n/a	1.50	n/a
17	30	18.30	364.90	366.31	1.41*	2.85	6.41	0.60	366.91	0.000	46.315	365.15	366.60	1.45**	2.95	6.21	0.60	367.20	0.000	0.000	n/a	1.14	n/a
18	24	10.21	365.25	366.60	1.35	1.86	4.53	0.47	367.07	0.000	32.500	365.45	366.59 j	1.14**	1.86	5.50	0.47	367.06	0.000	0.000	n/a	1.13	n/a
19	24	9.45	365.55	366.62	1.07*	1.71	5.52	0.45	367.06	0.000	46.316	365.80	366.90	1.10**	1.77	5.35	0.45	367.35	0.000	0.000	n/a	1.69	0.75
20	24	9.17	365.90	366.97	1.06*	1.69	5.42	0.44	367.40	0.000	83.149	366.35	367.43	1.08**	1.73	5.30	0.44	367.87	0.000	0.000	n/a	1.50	0.65
21	24	8.99	366.45	367.47	1.02*	1.60	5.61	0.43	367.90	0.000	40.491	366.70	367.77	1.07**	1.71	5.26	0.43	368.20	0.000	0.000	n/a	1.07	0.46
22	24	8.19	366.80	367.77	0.97	1.51	5.43	0.40	368.17	0.000	25.247	366.95	367.97	1.02**	1.61	5.10	0.40	368.37	0.000	0.000	n/a	2.25	0.91

Project File: Storm System 400.stm | Number of lines: 75 | Run Date: 11/16/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
23	15	5.10	373.58	374.11	0.53*	0.49	10.33	0.44	374.55	0.000	115.192	378.75	379.67	0.91**	0.96	5.30	0.44	380.10	0.000	0.000	n/a	1.50	n/a
24	15	2.99	379.00	379.67	0.67	0.67	4.48	0.28	379.95	0.000	116.558	384.35	385.05	0.69**	0.70	4.27	0.28	385.33	0.000	0.000	n/a	1.41	n/a
25	15	1.41	384.45	385.05	0.59	0.42	2.45	0.17	385.22	0.000	26.466	384.95	385.42 j	0.47**	0.42	3.35	0.17	385.59	0.000	0.000	n/a	1.00	0.17
26	18	8.73	373.70	374.44	0.74*	0.86	10.14	0.57	375.00	0.000	114.575	377.10	378.24	1.14**	1.44	6.04	0.57	378.81	0.000	0.000	n/a	1.50	0.85
27	18	5.93	377.20	378.24	1.04	1.17	4.55	0.40	378.64	0.000	135.495	379.80	380.73 j	0.94**	1.17	5.09	0.40	381.14	0.000	0.000	n/a	1.50	0.60
28	15	2.82	380.20	380.73	0.53	0.50	5.62	0.27	381.01	0.000	138.075	382.45	383.12	0.67**	0.67	4.18	0.27	383.39	0.000	0.000	n/a	1.50	n/a
29	15	1.65	382.55	383.12	0.57	0.47	3.00	0.19	383.31	0.000	32.501	382.75	383.26 j	0.51**	0.47	3.51	0.19	383.45	0.000	0.000	n/a	1.00	n/a
30	15	1.79	380.03	380.73	0.71	0.50	2.48	0.20	380.94	0.000	32.501	380.22	380.75	0.53**	0.50	3.60	0.20	380.95	0.000	0.000	n/a	1.00	0.20
31	15	3.21	367.20	367.97	0.77	0.73	4.06	0.26	368.22	0.509	51.780	367.50	368.22	0.72**	0.74	4.36	0.30	368.52	0.611	0.560	0.290	1.50	0.44
32	15	2.89	367.60	368.67	1.07	0.68	2.59	0.28	368.94	0.000	125.192	368.35	369.03	0.68**	0.68	4.21	0.28	369.31	0.000	0.000	n/a	1.50	0.41
33	15	2.12	368.45	369.03	0.58	0.56	3.79	0.22	369.26	0.000	126.727	374.15	374.73 j	0.58**	0.56	3.80	0.22	374.96	0.000	0.000	n/a	0.50	0.11
34	15	1.56	374.25	374.73	0.48	0.43	3.59	0.19	374.92	0.000	117.006	379.65	380.14	0.49**	0.45	3.45	0.19	380.33	0.000	0.000	n/a	0.50	0.09
35	15	0.95	379.75	380.14	0.39	0.32	2.85	0.14	380.28	0.000	117.502	384.75	385.13 j	0.38**	0.32	2.99	0.14	385.27	0.000	0.000	n/a	1.00	n/a
36	15	4.50	374.90	375.59	0.69*	0.69	6.52	0.39	375.98	0.000	119.484	376.60	377.46	0.86**	0.90	5.00	0.39	377.85	0.000	0.000	n/a	0.50	0.19
37	15	2.93	376.70	377.46	0.76	0.69	3.76	0.28	377.74	0.000	149.208	379.30	379.99 j	0.69**	0.69	4.24	0.28	380.27	0.000	0.000	n/a	0.50	n/a
38	15	0.93	379.40	379.99	0.59	0.31	1.64	0.14	380.12	0.000	121.017	381.70	382.08 j	0.38**	0.31	2.97	0.14	382.21	0.000	0.000	n/a	1.00	n/a
39	15	1.22	378.85	379.67	0.81	0.38	1.45	0.16	379.83	0.000	24.500	379.00	379.44	0.44**	0.38	3.21	0.16	379.60	0.000	0.000	n/a	1.00	0.16
40	15	1.61	377.36	378.24	0.88	0.46	1.74	0.19	378.43	0.000	32.503	377.55	378.05	0.50**	0.46	3.49	0.19	378.24	0.000	0.000	n/a	1.00	n/a
41	15	0.96	376.71	376.98	0.27*	0.19	4.95	0.14	377.12	0.000	103.397	378.94	379.32	0.38**	0.32	2.99	0.14	379.46	0.000	0.000	n/a	1.00	0.14
42	15	0.16	375.34	375.49	0.15*	0.08	1.84	0.05	375.55	0.000	24.500	375.49	375.64	0.15**	0.08	1.83	0.05	375.69	0.000	0.000	n/a	1.00	0.05
43	15	0.83	373.20	373.55	0.34*	0.27	3.02	0.13	373.68	0.000	24.498	373.35	373.71	0.36**	0.29	2.87	0.13	373.83	0.000	0.000	n/a	1.00	n/a
44	15	0.50	372.54	372.81	0.27*	0.19	2.61	0.10	372.91	0.000	24.500	372.69	372.97	0.28**	0.20	2.50	0.10	373.06	0.000	0.000	n/a	1.00	n/a

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Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
45	15	0.27	372.44	372.64	0.20*	0.12	2.17	0.07	372.71	0.000	24.500	372.59	372.79	0.20**	0.13	2.12	0.07	372.86	0.000	0.000	n/a	1.00	0.07
46	15	0.16	372.22	372.38	0.15*	0.09	1.86	0.05	372.43	0.000	24.500	372.37	372.52	0.15**	0.09	1.85	0.05	372.58	0.000	0.000	n/a	1.00	n/a
47	42	22.96	355.60	357.63	2.02	3.84	3.99	0.56	358.18	0.000	24.500	355.75	357.22	1.47**	3.84	5.98	0.56	357.78	0.000	0.000	n/a	1.50	0.84
48	36	21.71	355.85	357.25	1.40*	3.24	6.70	0.59	357.84	0.000	93.959	356.35	357.85	1.50**	3.52	6.16	0.59	358.44	0.000	0.000	n/a	0.50	n/a
49	36	21.62	356.45	357.87	1.42*	3.30	6.55	0.59	358.45	0.000	159.199	357.25	358.74	1.49**	3.51	6.15	0.59	359.33	0.000	0.000	n/a	1.50	0.88
50	30	20.77	357.35	358.90	1.55*	3.19	6.49	0.65	359.56	0.512	68.716	357.70	359.26 j	1.55**	3.20	6.48	0.65	359.91	0.512	0.512	0.352	1.35	0.88
51	30	20.51	357.80	360.14	2.33	3.17	4.30	0.65	360.79	0.000	96.731	358.30	359.84	1.54**	3.17	6.48	0.65	360.49	0.000	0.000	n/a	1.42	n/a
52	30	17.38	358.40	359.84	1.44	2.85	5.94	0.58	360.42	0.000	93.254	358.90	360.31 j	1.41**	2.85	6.09	0.58	360.89	0.000	0.000	n/a	1.44	n/a
53	30	15.94	359.00	360.31	1.31	2.60	6.13	0.54	360.86	0.000	24.500	359.15	360.50	1.35**	2.70	5.91	0.54	361.04	0.000	0.000	n/a	1.50	n/a
54	30	15.53	359.25	360.52	1.27*	2.52	6.17	0.53	361.06	0.000	65.109	359.60	360.93	1.33**	2.65	5.86	0.53	361.46	0.000	0.000	n/a	1.13	0.60
55	30	14.87	359.70	360.94	1.24*	2.44	6.10	0.52	361.46	0.000	46.337	359.95	361.25	1.30**	2.58	5.77	0.52	361.77	0.000	0.000	n/a	1.69	n/a
56	24	9.05	360.05	361.25	1.20	1.72	4.60	0.43	361.68	0.000	24.500	360.20	361.27	1.07**	1.72	5.27	0.43	361.70	0.000	0.000	n/a	0.98	n/a
57	24	8.82	360.15	361.27	1.12	1.69	4.86	0.42	361.69	0.000	53.921	360.45	361.51	1.06**	1.69	5.23	0.42	361.93	0.000	0.000	n/a	1.24	0.53
58	18	5.92	361.05	361.71	0.66*	0.74	7.96	0.40	362.11	0.000	133.468	363.75	364.69	0.94**	1.16	5.09	0.40	365.09	0.000	0.000	n/a	1.50	n/a
59	15	1.64	365.00	365.30	0.30*	0.23	7.10	0.19	365.50	0.000	161.703	371.20	371.71	0.51**	0.47	3.51	0.19	371.90	0.000	0.000	n/a	1.50	n/a
60	15	0.74	371.30	371.71	0.41	0.27	2.13	0.12	371.83	0.000	24.500	371.45	371.79 j	0.34**	0.27	2.78	0.12	371.91	0.000	0.000	n/a	1.00	0.12
61	15	1.51	370.15	370.62	0.47*	0.42	3.57	0.18	370.81	0.000	24.506	370.30	370.79	0.49**	0.44	3.42	0.18	370.97	0.000	0.000	n/a	1.00	0.18
62	18	6.03	360.45	361.27	0.82*	0.99	6.11	0.41	361.68	0.000	121.968	361.65	362.60	0.95**	1.18	5.12	0.41	363.01	0.000	0.000	n/a	1.50	n/a
63	15	2.96	361.95	362.60	0.65	0.64	4.62	0.28	362.88	0.000	242.563	368.83	369.52	0.69**	0.70	4.25	0.28	369.80	0.000	0.000	n/a	0.50	n/a
64	15	1.06	368.93	369.52	0.59	0.34	1.85	0.15	369.67	0.000	137.194	372.86	373.26 j	0.40**	0.34	3.08	0.15	373.41	0.000	0.000	n/a	1.00	0.15
65	15	3.63	355.00	359.07	1.25	0.79	2.96	0.14	359.21	0.316	40.184	359.00	359.77 j	0.77**	0.79	4.58	0.33	360.10	0.649	0.483	n/a	1.50	n/a
66	15	3.53	361.50	361.97	0.47*	0.42	8.35	0.32	362.30	0.000	77.647	364.05	364.81	0.76**	0.78	4.54	0.32	365.13	0.000	0.000	n/a	1.48	0.47

Project File: Storm System 400.stm | Number of lines: 75 | Run Date: 11/16/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

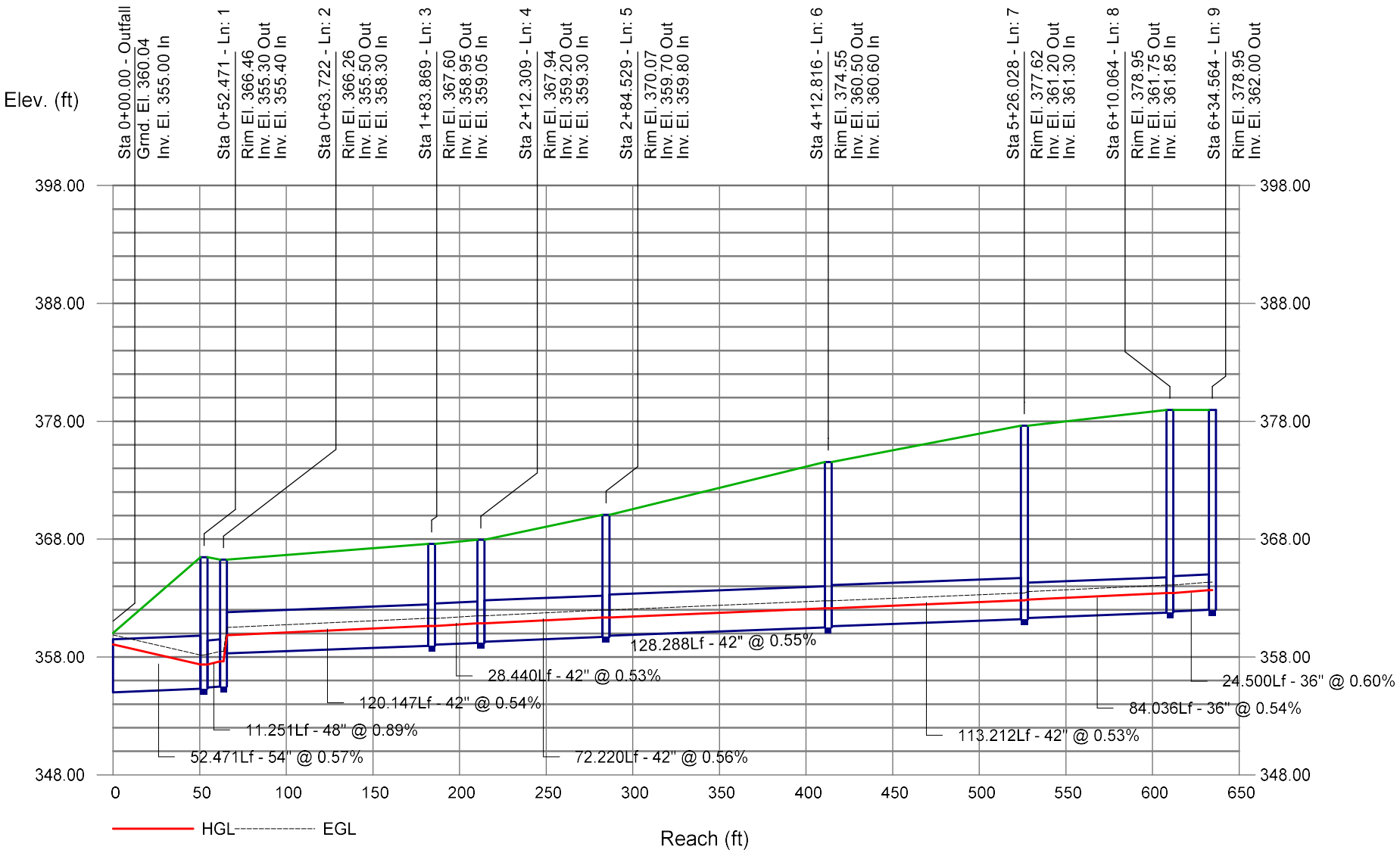
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
67	15	3.09	364.15	364.81	0.66	0.66	4.71	0.29	365.10	0.000	84.085	365.60	366.31	0.71**	0.72	4.32	0.29	366.60	0.000	0.000	n/a	0.67	0.19
68	15	2.14	365.70	366.31	0.61	0.56	3.62	0.23	366.53	0.000	168.625	368.50	369.08 j	0.58**	0.56	3.81	0.23	369.31	0.000	0.000	n/a	1.00	n/a
69	15	3.15	363.85	364.69	0.84	0.88	3.59	0.20	364.89	0.379	24.500	364.00	364.73	0.73	0.75	4.21	0.28	365.01	0.567	0.473	0.116	0.50	0.14
70	15	2.25	364.10	364.87	0.77	0.58	2.83	0.23	365.10	0.000	31.939	364.30	364.90	0.60**	0.58	3.87	0.23	365.13	0.000	0.000	n/a	1.00	n/a
71	15	0.31	361.90	362.11	0.21*	0.14	2.25	0.07	362.19	0.000	24.500	362.05	362.26	0.21**	0.14	2.19	0.07	362.34	0.000	0.000	n/a	1.00	0.07
72	18	1.98	360.55	361.51	0.96	0.56	1.66	0.20	361.70	0.000	24.500	360.70	361.23	0.53**	0.56	3.55	0.20	361.42	0.000	0.000	n/a	0.50	0.10
73	15	1.54	360.80	361.26	0.46*	0.41	3.72	0.18	361.44	0.000	30.685	361.00	361.49	0.49**	0.45	3.44	0.18	361.68	0.000	0.000	n/a	1.00	0.18
74	15	0.18	359.25	360.14	0.88	0.09	0.19	0.06	360.19	0.000	24.500	359.40	359.56	0.16**	0.09	1.89	0.06	359.62	0.000	0.000	n/a	1.00	n/a
75	15	3.27	360.50	361.24	0.74*	0.74	4.34	0.29	361.53	0.600	24.498	360.65	361.39 j	0.74**	0.75	4.34	0.29	361.68	0.599	0.599	0.147	1.00	0.29

Project File: Storm System 400.stm | Number of lines: 75 | Run Date: 11/16/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

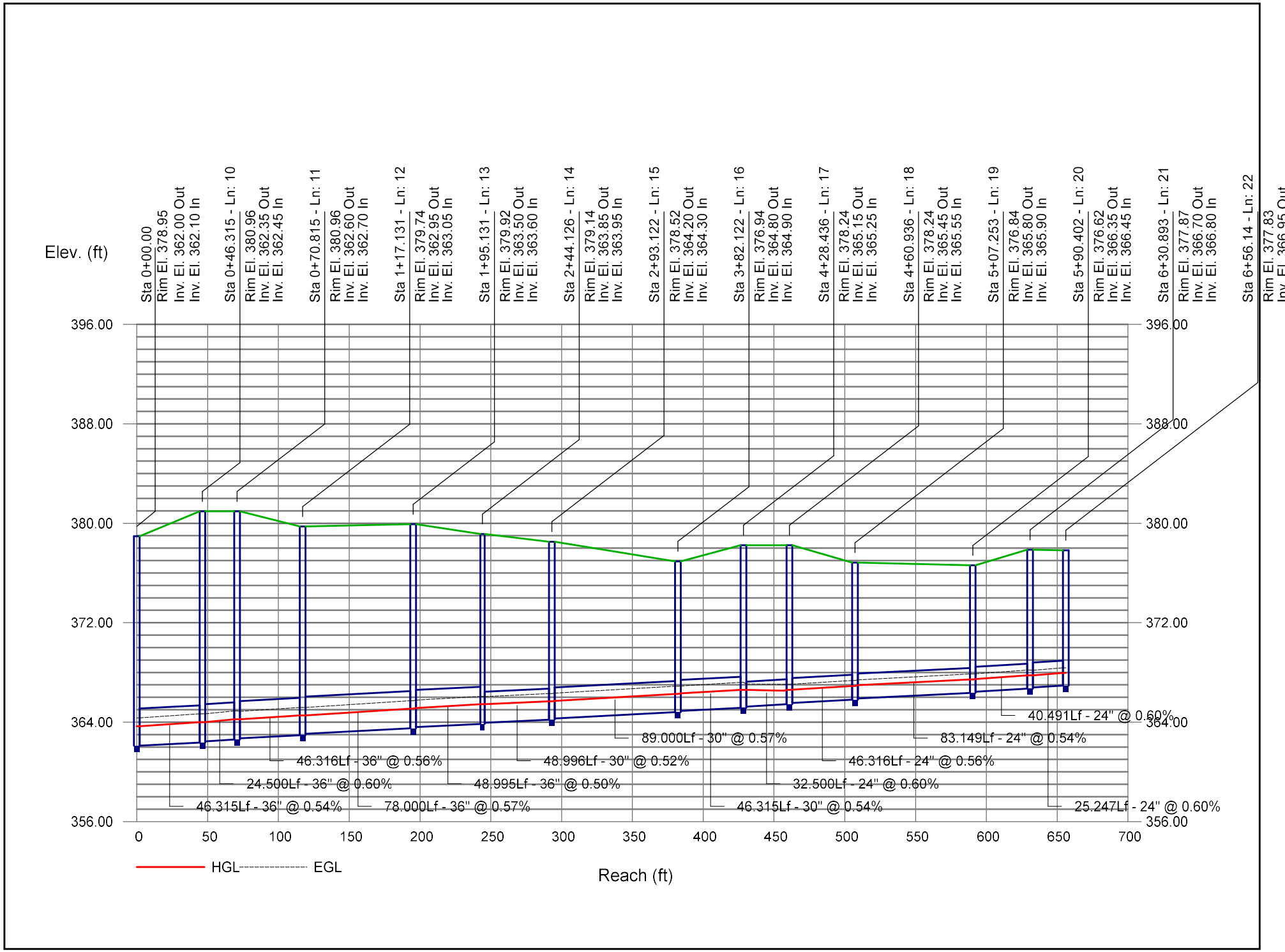
Storm Sewer Profile

Proj. file: Storm System 400.stm



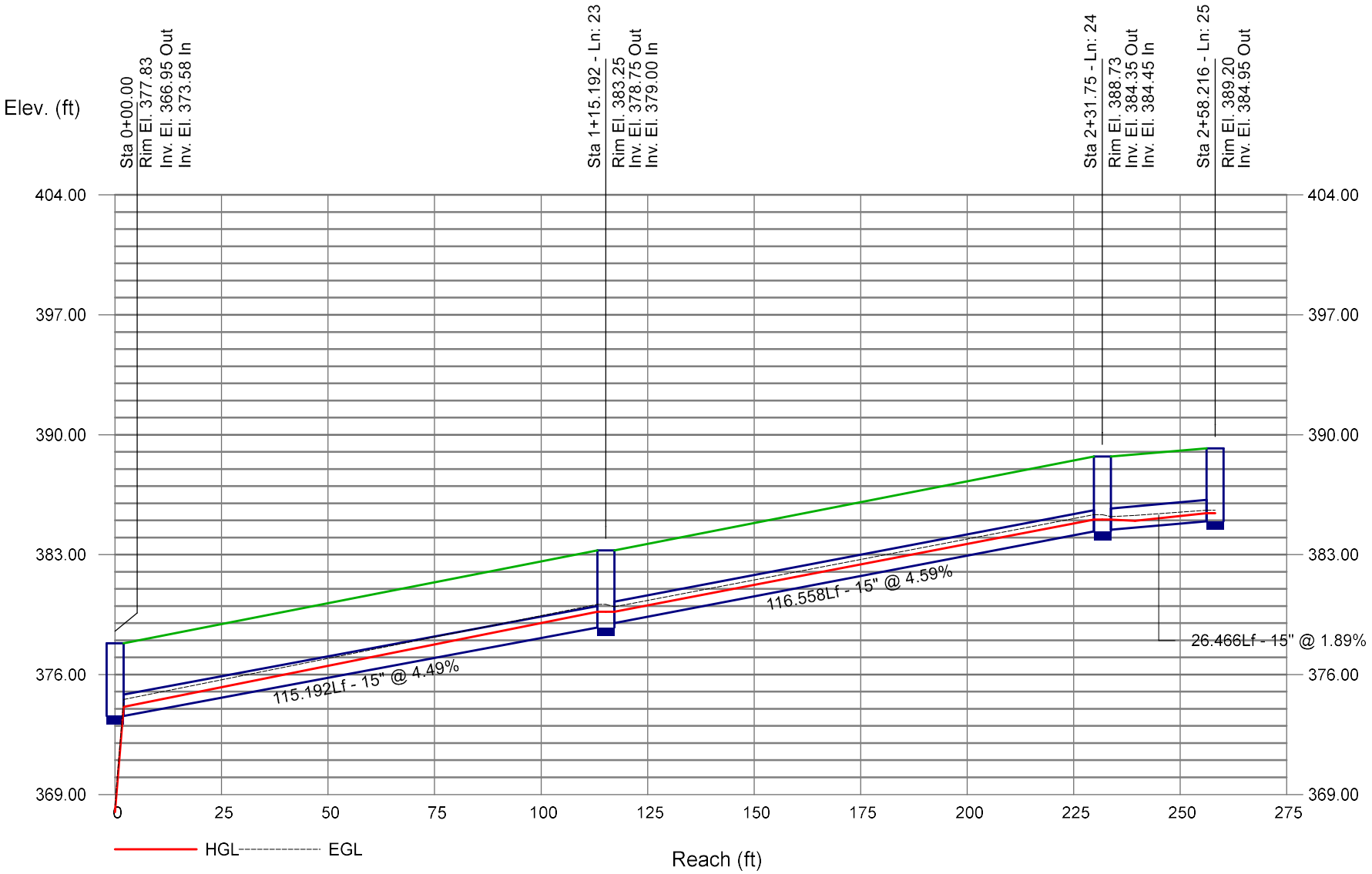
Storm Sewer Profile

Proj. file: Storm System 400.stm



Storm Sewer Profile

Proj. file: Storm System 400.stm



Storm Sewer Profile

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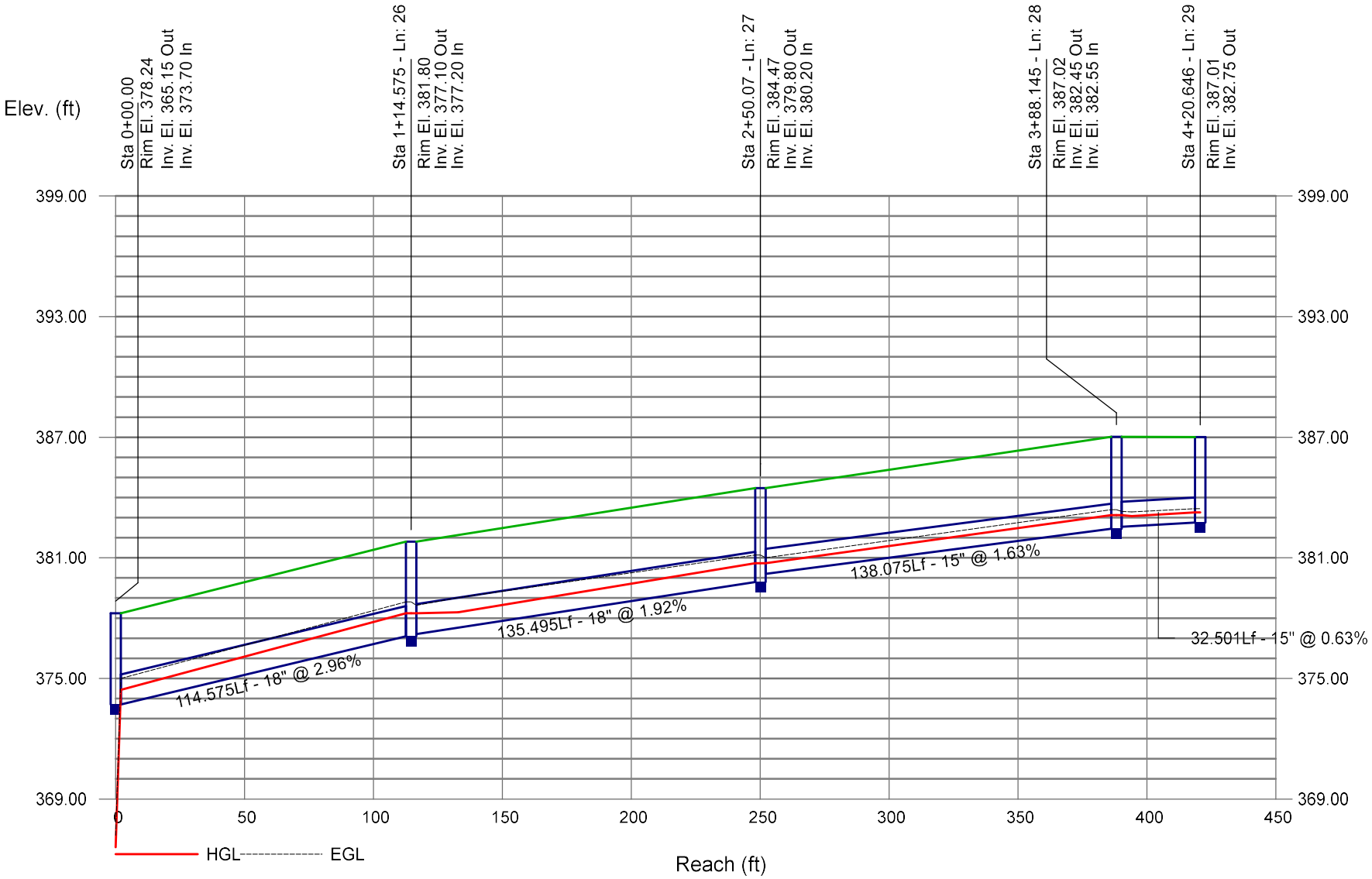

Storm Sewer Profile

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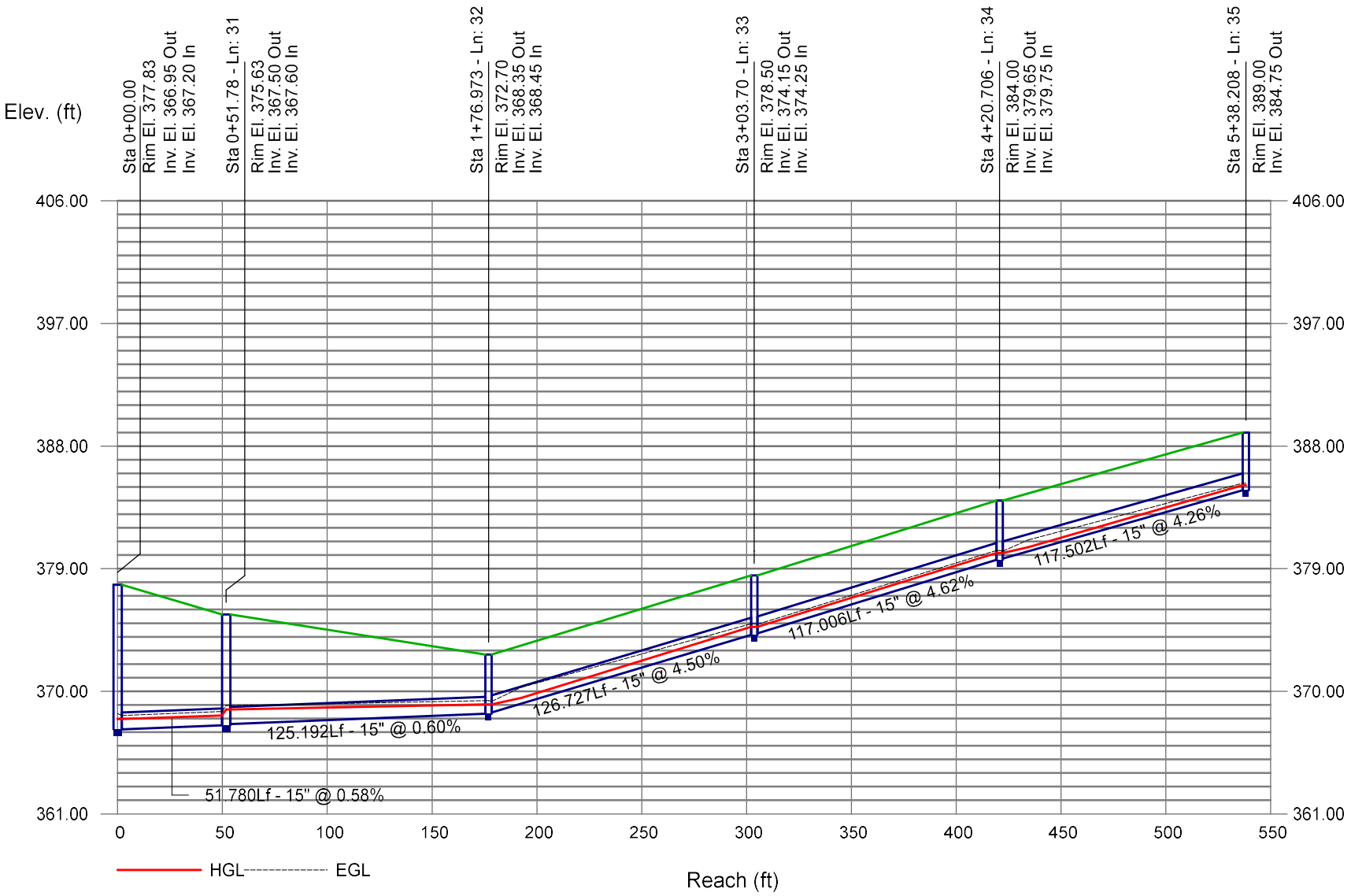

Storm Sewer Profile

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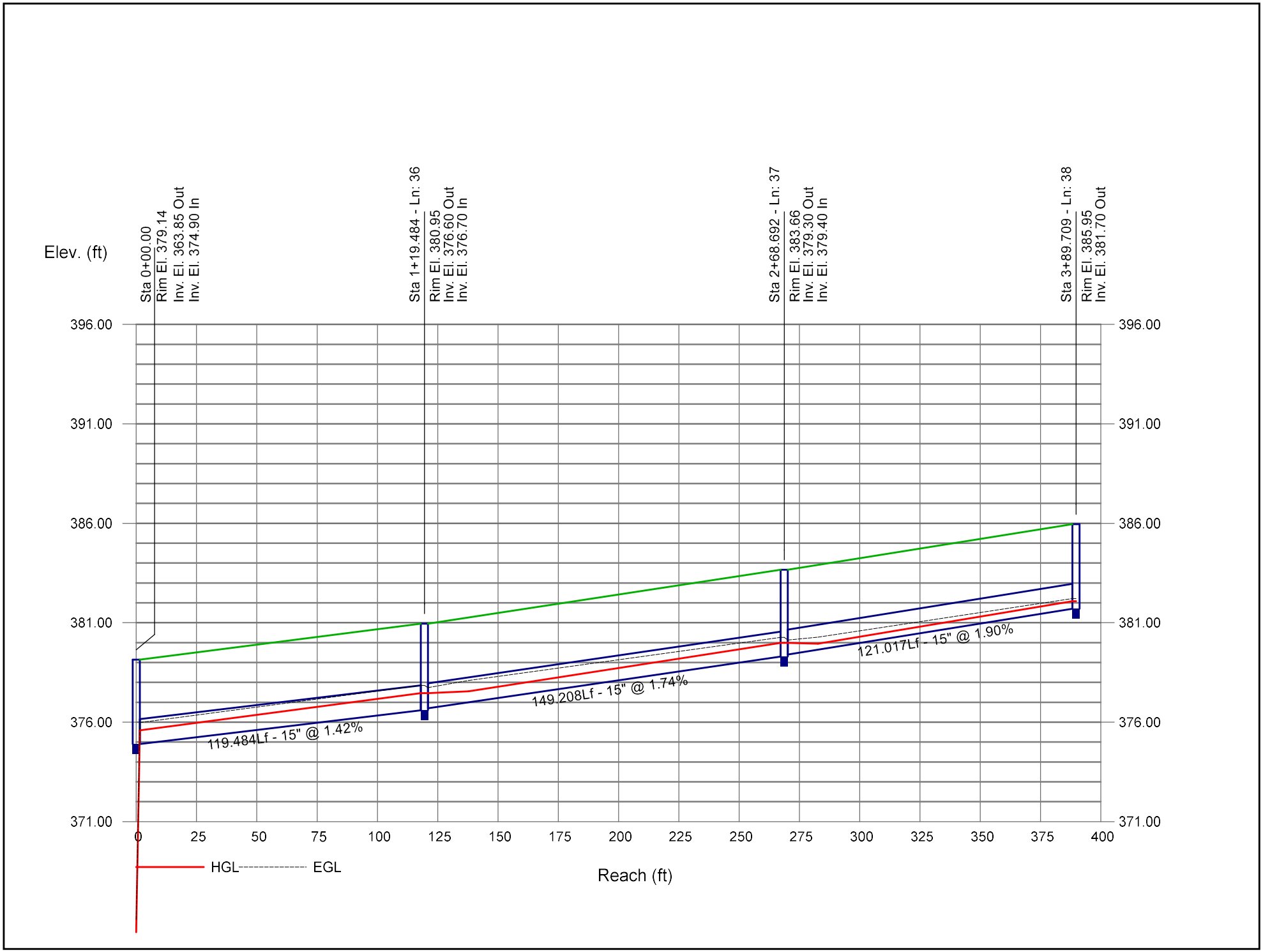

Storm Sewer Profile

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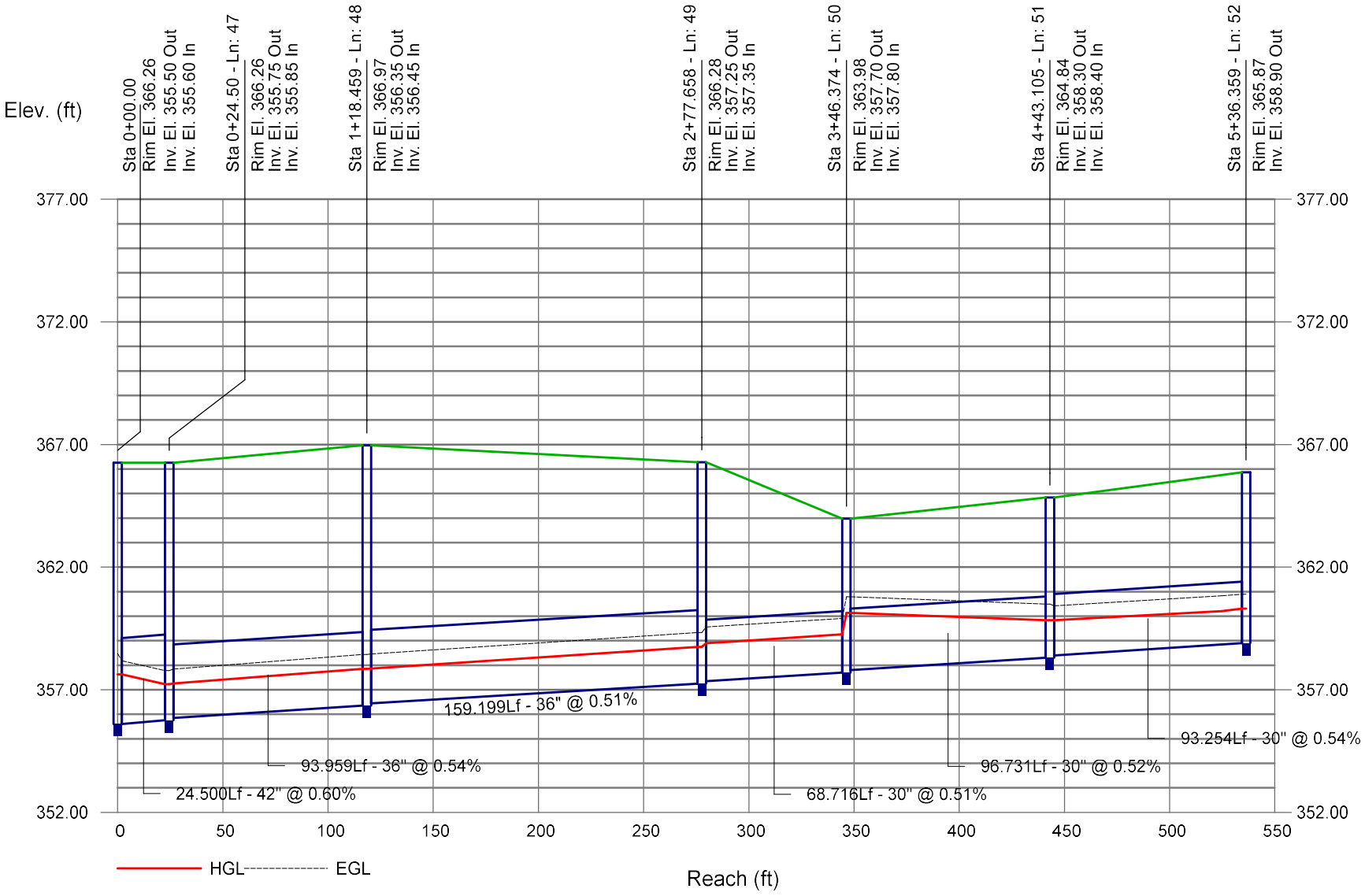
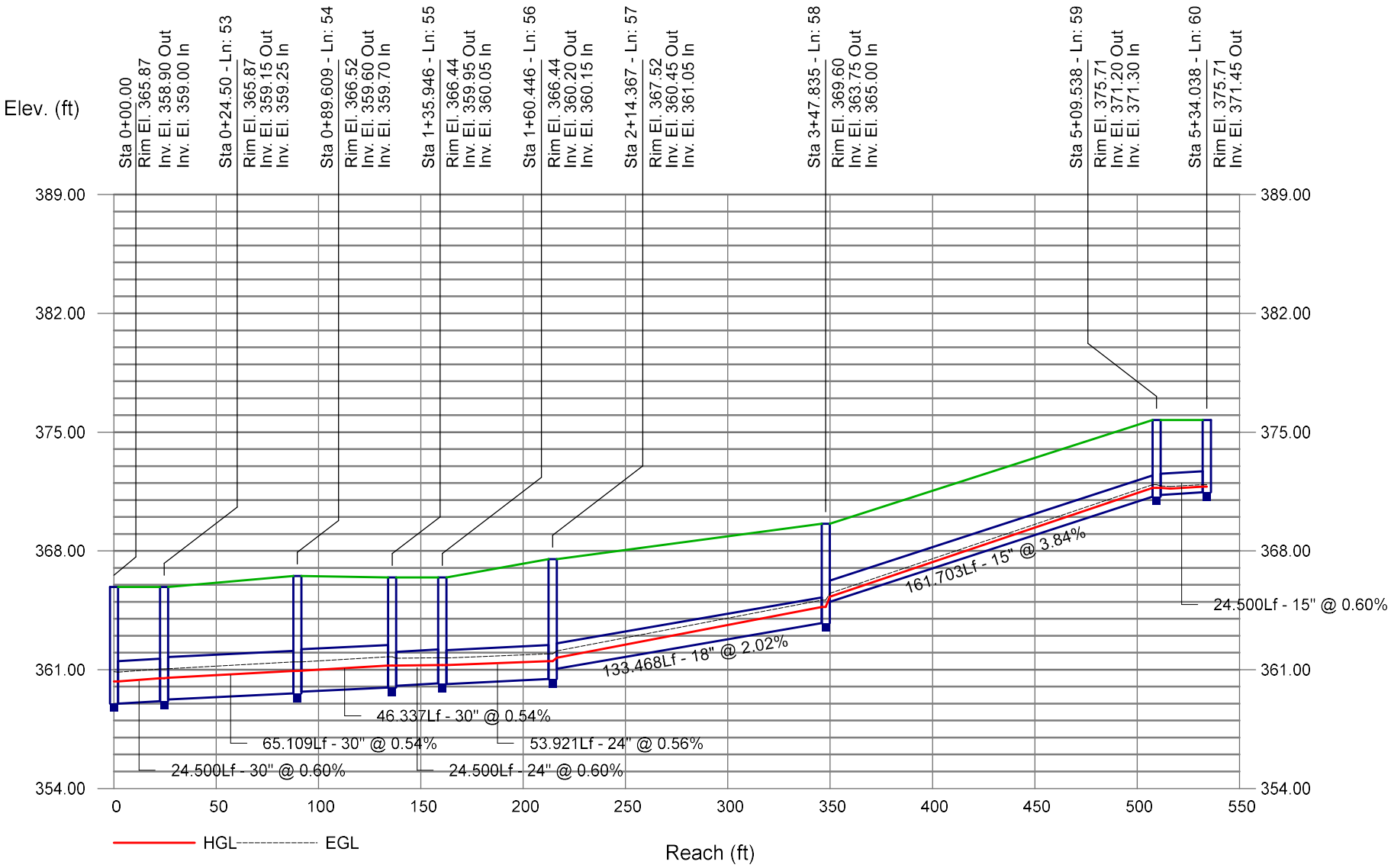


Storm Sewer Profile

Proj. file: Storm System 400.stm



Storm Sewer Profile

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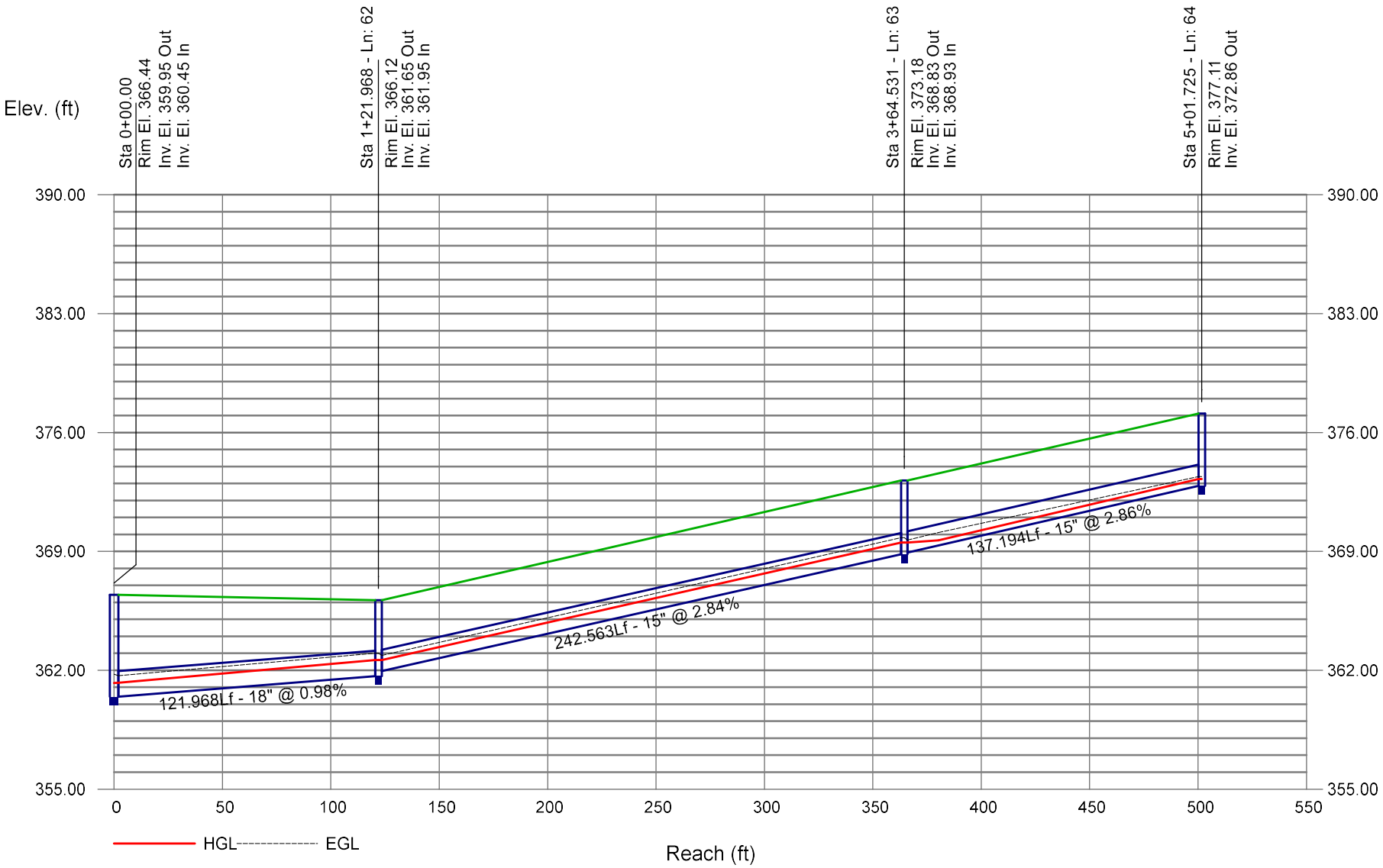

Storm Sewer Profile

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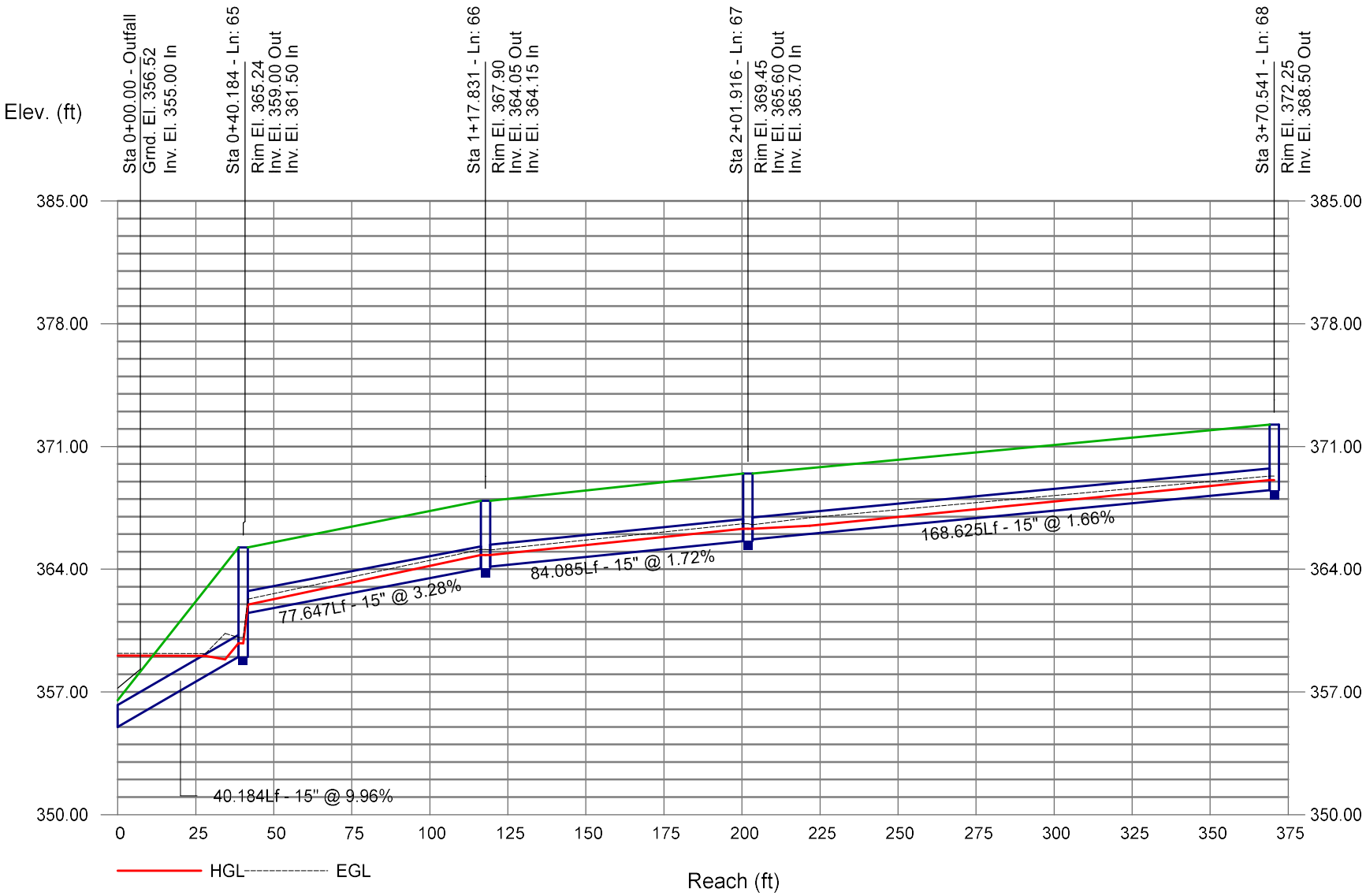
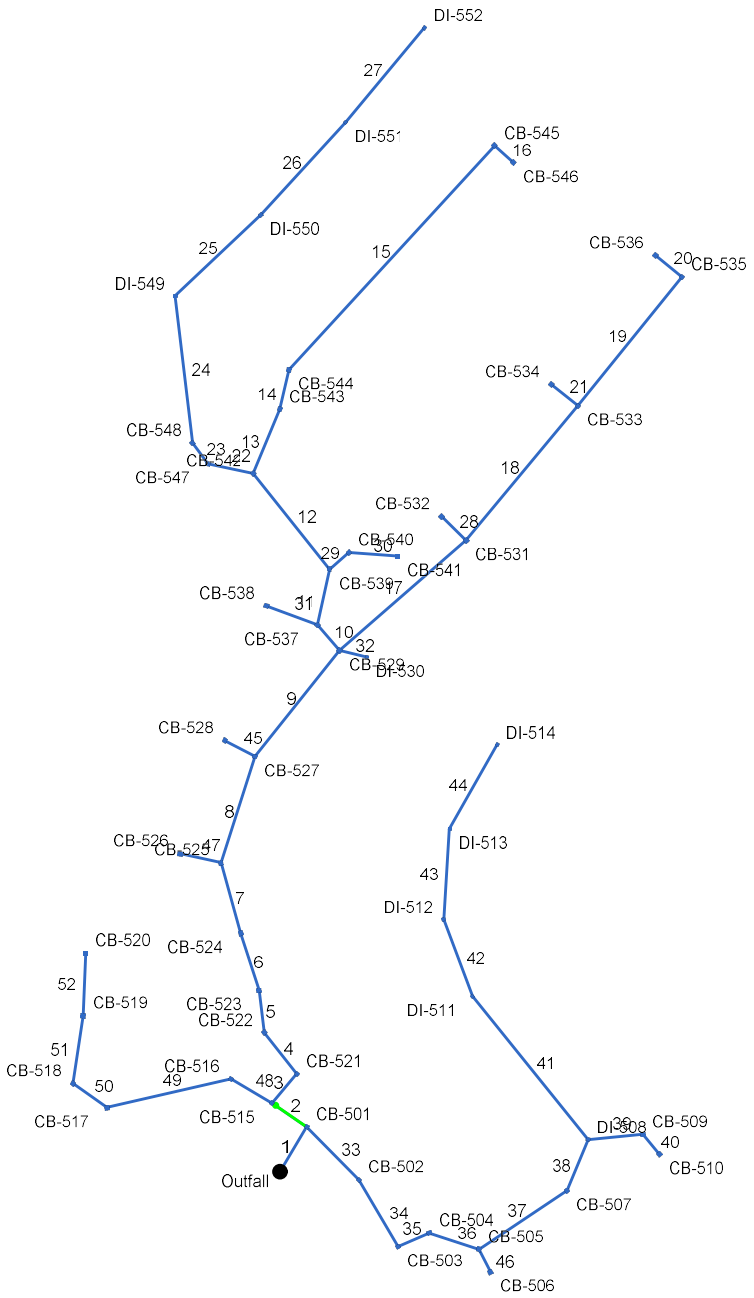


SYSTEM 500 – REPORTS AND PROFILES

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: Storm System 500.stm	Number of lines: 52	Date: 11/23/2020

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	500-501	40.50	54	Cir	49.948	344.00	344.25	0.507	348.12	346.08	1.04	346.08	End	Combination
2	501-515	30.47	48	Cir	39.865	344.35	344.60	0.625	346.08	346.24	n/a	346.24 j	1	Combination
3	515-521	25.74	36	Cir	36.588	344.83	345.05	0.600	346.32	346.68	n/a	346.68	2	Combination
4	521-522	25.73	36	Cir	50.272	345.15	345.45	0.600	346.68	347.08	0.57	347.08	3	Combination
5	522-523	25.69	36	Cir	40.896	345.55	345.80	0.625	347.08	347.44	n/a	347.44	4	Combination
6	523-524	25.59	36	Cir	57.512	345.90	346.25	0.600	347.44	347.88	0.33	347.88	5	Combination
7	524-525	25.17	30	Cir	70.340	346.35	346.75	0.571	348.06	348.46	1.03	349.50	6	Combination
8	525-527	24.08	30	Cir	106.739	347.10	349.90	2.619	349.50	351.56	n/a	351.56 j	7	Combination
9	527-529	22.60	30	Cir	130.040	350.05	354.30	3.264	351.56	355.91	n/a	355.91	8	Combination
10	529-537	11.03	24	Cir	32.501	355.20	355.40	0.600	356.36	356.59	n/a	356.59	9	Combination
11	537-539	10.47	24	Cir	54.556	355.50	356.50	1.834	356.59	357.66	n/a	357.66	10	Combination
12	539-542	8.91	24	Cir	117.471	356.60	357.25	0.549	357.66	358.31	n/a	358.31	11	Combination
13	542-543	6.63	18	Cir	66.325	359.90	362.45	3.845	360.49	363.44	n/a	363.44	12	Combination
14	543-544	4.84	15	Cir	38.889	362.70	363.95	3.214	363.44	364.84	0.34	364.84	13	Combination
15	544-545	3.73	15	Cir	291.492	364.05	367.45	1.167	364.84	368.23	n/a	368.23 j	14	Combination
16	545-546	1.86	15	Cir	24.500	367.55	367.70	0.600	368.23	368.24	n/a	368.24	15	Combination
17	529-531	12.48	24	Cir	160.212	355.50	360.40	3.055	356.27	361.66	n/a	361.66	9	Combination
18	531-533	8.70	18	Cir	167.742	361.00	364.10	1.845	361.85	365.24	0.85	365.24	17	Combination
19	533-535	5.05	15	Cir	158.720	364.50	366.80	1.452	365.24	367.72	0.65	367.72	18	Combination
20	535-536	2.31	15	Cir	32.500	366.90	367.10	0.631	367.72	367.71	n/a	367.71 j	19	Combination
21	533-534	1.96	15	Cir	32.500	364.30	364.50	0.631	365.24	365.06	n/a	365.06	18	Combination
22	542-547	3.34	15	Cir	43.984	357.84	358.10	0.600	358.58	358.85	0.32	359.16	12	Combination
23	547-548	3.31	15	Cir	24.626	358.20	358.35	0.600	359.16	359.20	0.18	359.38	22	Combination
24	548-549	2.67	15	Cir	142.125	358.45	359.20	0.530	359.38	359.86	n/a	359.86	23	DropGrate

Project File: Storm System 500.stm | Number of lines: 52 | Run Date: 11/23/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	549-550	2.11	15	Cir	112.849	359.30	363.00	3.280	359.86	363.58	n/a	363.58	24	DropGrate
26	550-551	1.44	15	Cir	120.001	363.10	363.75	0.542	363.58	364.23	n/a	364.23 j	25	DropGrate
27	551-552	0.82	15	Cir	118.109	363.85	364.55	0.592	364.23	364.90	0.13	364.90	26	DropGrate
28	531-532	2.21	15	Cir	32.507	361.05	361.25	0.600	361.66	361.84	0.23	361.84	17	Combination
29	539-540	1.43	15	Cir	24.500	358.10	358.25	0.600	358.56	358.72	n/a	358.72	11	Combination
30	540-541	0.54	15	Cir	46.315	358.35	359.50	2.483	358.72	359.79	n/a	359.79 j	29	Combination
31	537-538	0.51	15	Cir	52.252	356.25	357.90	3.158	356.59	358.18	n/a	358.18 j	10	Combination
32	529-530	1.19	15	Cir	26.744	356.25	357.05	2.991	356.53	357.48	n/a	357.48	9	DropGrate
33	501-502	12.12	24	Cir	71.386	346.72	347.15	0.600	347.94	348.40	n/a	348.40	1	Combination
34	502-503	12.01	24	Cir	74.288	347.25	347.65	0.546	348.50	348.91	0.78	349.68	33	Combination
35	503-504	11.92	24	Cir	32.488	347.75	347.95	0.600	349.68	349.19	0.57	349.19	34	Combination
36	504-505	10.91	24	Cir	49.900	348.05	348.30	0.500	349.26	349.51	0.79	350.30	35	Combination
37	505-507	9.81	24	Cir	101.340	348.40	348.95	0.541	350.30	350.07	n/a	350.07	36	Combination
38	507-508	9.87	24	Cir	52.810	349.05	349.35	0.581	350.13	350.48	0.93	350.48	37	DropGrate
39	508-509	1.24	15	Cir	52.750	353.15	355.45	4.366	353.41	355.89	n/a	355.89	38	Combination
40	509-510	0.61	15	Cir	24.500	355.55	355.70	0.600	355.89	356.00	0.11	356.00	39	Combination
41	508-511	8.83	24	Cir	176.240	349.45	350.40	0.538	350.49	351.46	0.23	351.46	38	DropGrate
42	511-512	5.42	18	Cir	78.654	350.90	351.50	0.763	351.73	352.40	n/a	352.40	41	DropGrate
43	512-513	4.28	15	Cir	86.876	351.75	353.80	2.360	352.40	354.64	0.28	354.64	42	DropGrate
44	513-514	2.74	15	Cir	92.700	353.90	356.60	2.913	354.64	357.26	n/a	357.26 j	43	DropGrate
45	527-528	0.89	15	Cir	32.503	351.60	351.80	0.631	351.95	352.17	0.13	352.17	8	Combination
46	505-506	1.12	15	Cir	24.260	350.50	350.65	0.600	350.91	351.07	0.15	351.07	36	Combination
47	525-526	0.55	15	Cir	39.995	348.40	348.65	0.625	349.50	348.94	n/a	348.94	7	Combination
48	515-516	6.29	24	Cir	45.564	344.80	345.05	0.534	346.24	345.93	n/a	345.93	2	Combination

Project File: Storm System 500.stm | Number of lines: 52 | Run Date: 11/23/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
49	516-517	6.22	18	Cir	121.617	345.30	346.00	0.575	346.29	346.99	0.45	347.45	48	Combination
50	517-518	5.62	18	Cir	39.979	346.10	346.40	0.750	347.45	347.31	n/a	347.31	49	Combination
51	518-519	5.03	15	Cir	65.834	346.70	347.05	0.539	347.81	348.16	0.15	348.31	50	Combination
52	519-520	3.37	15	Cir	59.959	347.15	347.45	0.500	348.31	348.43	0.17	348.60	51	Combination

Project File: Storm System 500.stm

Number of lines: 52

Run Date: 11/23/2020

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	49.948	0.05	11.19	0.85	0.04	8.07	5.0	14.7	5.0	40.50	140.0	4.66	54	0.51	344.00	344.25	348.12	346.08	349.04	353.16	500-501
2	1	39.865	0.03	8.32	0.85	0.03	6.03	5.0	14.5	5.1	30.47	113.6	6.08	48	0.63	344.35	344.60	346.08	346.24	353.16	352.95	501-515
3	2	36.588	0.04	7.06	0.85	0.03	5.07	5.0	14.3	5.1	25.74	51.66	6.91	36	0.60	344.83	345.05	346.32	346.68	352.95	353.03	515-521
4	3	50.272	0.04	7.02	0.85	0.03	5.03	5.0	14.1	5.1	25.73	51.66	6.80	36	0.60	345.15	345.45	346.68	347.08	353.03	353.15	521-522
5	4	40.896	0.07	6.98	0.81	0.06	5.00	5.0	14.0	5.1	25.69	52.71	6.79	36	0.62	345.55	345.80	347.08	347.44	353.15	353.86	522-523
6	5	57.512	0.15	6.91	0.75	0.11	4.94	5.0	13.7	5.2	25.59	51.65	6.77	36	0.60	345.90	346.25	347.44	347.88	353.86	353.36	523-524
7	6	70.340	0.25	6.76	0.72	0.18	4.83	5.0	13.5	5.2	25.17	31.00	7.03	30	0.57	346.35	346.75	348.06	348.46	353.36	352.92	524-525
8	7	106.739	0.30	6.42	0.71	0.21	4.57	5.0	13.2	5.3	24.08	66.36	5.94	30	2.62	347.10	349.90	349.50	351.56	352.92	356.07	525-527
9	8	130.040	0.19	5.97	0.82	0.16	4.24	5.0	12.8	5.3	22.60	74.10	7.00	30	3.26	350.05	354.30	351.56	355.91	356.07	360.50	527-529
10	9	32.501	0.06	2.92	0.80	0.05	2.06	5.0	12.6	5.4	11.03	17.52	5.77	24	0.60	355.20	355.40	356.36	356.59	360.50	360.50	529-537
11	10	54.556	0.14	2.75	0.75	0.11	1.94	5.0	12.4	5.4	10.47	30.63	5.77	24	1.83	355.50	356.50	356.59	357.66	360.50	362.64	537-539
12	11	117.471	0.01	2.32	0.82	0.01	1.62	5.0	11.8	5.5	8.91	16.76	5.26	24	0.55	356.60	357.25	357.66	358.31	362.64	364.44	539-542
13	12	66.325	0.39	1.43	0.71	0.28	1.01	5.0	7.0	6.6	6.63	20.59	7.85	18	3.84	359.90	362.45	360.49	363.44	364.44	366.98	542-543
14	13	38.889	0.29	1.04	0.71	0.21	0.73	5.0	6.9	6.6	4.84	11.58	5.76	15	3.21	362.70	363.95	363.44	364.84	366.98	368.29	543-544
15	14	291.492	0.38	0.75	0.70	0.27	0.53	5.0	5.3	7.1	3.73	6.98	4.59	15	1.17	364.05	367.45	364.84	368.23	368.29	371.98	544-545
16	15	24.500	0.37	0.37	0.70	0.26	0.26	5.0	5.0	7.2	1.86	5.00	3.19	15	0.60	367.55	367.70	368.23	368.24	371.98	371.98	545-546
17	9	160.212	0.41	2.64	0.70	0.29	1.86	5.0	6.5	6.7	12.48	39.53	8.54	24	3.06	355.50	360.40	356.27	361.66	360.50	365.52	529-531
18	17	167.742	0.39	1.79	0.71	0.28	1.26	5.0	5.9	6.9	8.70	14.26	7.25	18	1.85	361.00	364.10	361.85	365.24	365.52	368.75	531-533
19	18	158.720	0.55	1.01	0.71	0.39	0.71	5.0	5.3	7.1	5.05	7.78	6.00	15	1.45	364.50	366.80	365.24	367.72	368.75	371.37	533-535
20	19	32.500	0.46	0.46	0.70	0.32	0.32	5.0	5.0	7.2	2.31	5.13	3.31	15	0.63	366.90	367.10	367.72	367.71	371.37	371.37	535-536
21	18	32.500	0.39	0.39	0.70	0.27	0.27	5.0	5.0	7.2	1.96	5.13	2.84	15	0.63	364.30	364.50	365.24	365.06	368.75	368.75	533-534
22	12	43.984	0.01	0.88	0.88	0.01	0.60	5.0	11.5	5.6	3.34	5.00	4.37	15	0.60	357.84	358.10	358.58	358.85	364.44	363.38	542-547

Project File: Storm System 500.stm

Number of lines: 52

Run Date: 11/23/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	22	24.626	0.17	0.87	0.76	0.13	0.59	5.0	11.4	5.6	3.31	5.00	3.49	15	0.60	358.20	358.35	359.16	359.20	363.38	363.39	547-548
24	23	142.125	0.17	0.70	0.65	0.11	0.46	5.0	10.5	5.8	2.67	4.70	3.42	15	0.53	358.45	359.20	359.38	359.86	363.39	363.55	548-549
25	24	112.849	0.19	0.53	0.66	0.13	0.35	5.0	9.5	6.0	2.11	11.69	3.90	15	3.28	359.30	363.00	359.86	363.58	363.55	369.05	549-550
26	25	120.001	0.17	0.34	0.67	0.11	0.23	5.0	8.0	6.3	1.44	4.75	3.35	15	0.54	363.10	363.75	363.58	364.23	369.05	369.00	550-551
27	26	118.109	0.17	0.17	0.67	0.11	0.11	5.0	5.0	7.2	0.82	4.97	2.75	15	0.59	363.85	364.55	364.23	364.90	369.00	368.80	551-552
28	17	32.507	0.44	0.44	0.70	0.31	0.31	5.0	5.0	7.2	2.21	5.00	3.79	15	0.60	361.05	361.25	361.66	361.84	365.52	365.52	531-532
29	11	24.500	0.19	0.29	0.74	0.14	0.22	5.0	6.8	6.6	1.43	5.00	3.44	15	0.60	358.10	358.25	358.56	358.72	362.64	362.64	539-540
30	29	46.315	0.10	0.10	0.75	0.08	0.08	5.0	5.0	7.2	0.54	10.18	2.15	15	2.48	358.35	359.50	358.72	359.79	362.64	363.78	540-541
31	10	52.252	0.11	0.11	0.65	0.07	0.07	5.0	5.0	7.2	0.51	11.47	2.21	15	3.16	356.25	357.90	356.59	358.18	360.50	361.85	537-538
32	9	26.744	0.22	0.22	0.75	0.17	0.17	5.0	5.0	7.2	1.19	11.17	4.55	15	2.99	356.25	357.05	356.53	357.48	360.50	361.30	529-530
33	1	71.386	0.05	2.82	0.85	0.04	2.00	5.0	9.1	6.1	12.12	17.52	5.94	24	0.60	346.72	347.15	347.94	348.40	353.16	354.22	501-502
34	33	74.288	0.03	2.77	0.85	0.03	1.96	5.0	8.8	6.1	12.01	16.72	5.79	24	0.55	347.25	347.65	348.50	348.91	354.22	355.11	502-503
35	34	32.488	0.23	2.74	0.78	0.18	1.93	5.0	8.6	6.2	11.92	17.52	4.83	24	0.60	347.75	347.95	349.68	349.19	355.11	355.11	503-504
36	35	49.900	0.07	2.51	0.78	0.05	1.75	5.0	8.4	6.2	10.91	15.99	5.47	24	0.50	348.05	348.30	349.26	349.51	355.11	354.90	504-505
37	36	101.340	0.01	2.22	0.82	0.01	1.54	5.0	7.8	6.4	9.81	16.63	4.30	24	0.54	348.40	348.95	350.30	350.07	354.90	356.50	505-507
38	37	52.810	0.05	2.21	0.83	0.04	1.53	5.0	7.6	6.4	9.87	17.24	5.55	24	0.58	349.05	349.35	350.13	350.48	356.50	357.42	507-508
39	38	52.750	0.12	0.22	0.78	0.09	0.18	5.0	5.8	6.9	1.24	13.49	5.03	15	4.37	353.15	355.45	353.41	355.89	357.42	359.96	508-509
40	39	24.500	0.10	0.10	0.85	0.09	0.09	5.0	5.0	7.2	0.61	5.00	2.46	15	0.60	355.55	355.70	355.89	356.00	359.96	359.96	509-510
41	38	176.240	0.78	1.94	0.67	0.52	1.31	5.0	6.5	6.7	8.83	16.58	5.29	24	0.54	349.45	350.40	350.49	351.46	357.42	355.40	508-511
42	41	78.654	0.26	1.16	0.68	0.18	0.79	5.0	6.1	6.8	5.42	9.17	5.16	18	0.76	350.90	351.50	351.73	352.40	355.40	356.00	511-512
43	42	86.876	0.34	0.90	0.69	0.23	0.62	5.0	5.7	7.0	4.28	9.92	5.80	15	2.36	351.75	353.80	352.40	354.64	356.00	358.14	512-513
44	43	92.700	0.56	0.56	0.68	0.38	0.38	5.0	5.0	7.2	2.74	11.02	3.89	15	2.91	353.90	356.60	354.64	357.26	358.14	360.86	513-514

Project File: Storm System 500.stm | Number of lines: 52 | Run Date: 11/23/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
45	8	32.503	0.15	0.15	0.83	0.12	0.12	5.0	5.0	7.2	0.89	5.13	3.04	15	0.63	351.60	351.80	351.95	352.17	356.07	356.07	527-528
46	36	24.260	0.22	0.22	0.71	0.16	0.16	5.0	5.0	7.2	1.12	5.00	3.21	15	0.60	350.50	350.65	350.91	351.07	354.90	354.90	505-506
47	7	39.995	0.09	0.09	0.85	0.08	0.08	5.0	5.0	7.2	0.55	5.11	1.52	15	0.63	348.40	348.65	349.50	348.94	352.92	352.91	525-526
48	2	45.564	0.04	1.23	0.85	0.03	0.93	5.0	6.4	6.7	6.29	16.53	3.64	24	0.53	344.80	345.05	346.24	345.93	352.95	353.06	515-516
49	48	121.617	0.11	1.19	0.85	0.09	0.90	5.0	5.8	6.9	6.22	7.97	4.98	18	0.58	345.30	346.00	346.29	346.99	353.06	352.37	516-517
50	49	39.979	0.11	1.08	0.85	0.09	0.81	5.0	5.6	7.0	5.62	9.09	4.17	18	0.75	346.10	346.40	347.45	347.31	352.37	352.39	517-518
51	50	65.834	0.30	0.97	0.81	0.24	0.71	5.0	5.4	7.1	5.03	4.74	4.36	15	0.54	346.70	347.05	347.81	348.16	352.39	351.54	518-519
52	51	59.959	0.67	0.67	0.70	0.47	0.47	5.0	5.0	7.2	3.37	4.56	3.05	15	0.50	347.15	347.45	348.31	348.43	351.54	351.20	519-520

Project File: Storm System 500.stm

Number of lines: 52

Run Date: 11/23/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	54	40.50	344.00	348.12	4.12	6.08	2.65	0.69	348.81	0.000	49.948	344.25	346.08	1.83**	6.08	6.66	0.69	346.77	0.000	0.000	n/a	1.50	1.04
2	48	30.47	344.35	346.08	1.73	4.84	5.85	0.62	346.70	0.000	39.865	344.60	346.24 j	1.64**	4.84	6.30	0.62	346.86	0.000	0.000	n/a	1.50	n/a
3	36	25.74	344.83	346.32	1.50*	3.53	7.30	0.66	346.99	0.000	36.588	345.05	346.68	1.64**	3.94	6.53	0.66	347.34	0.000	0.000	n/a	1.48	n/a
4	36	25.73	345.15	346.68	1.54	3.64	7.06	0.66	347.35	0.000	50.272	345.45	347.08	1.64**	3.94	6.53	0.66	347.75	0.000	0.000	n/a	0.86	0.57
5	36	25.69	345.55	347.08	1.54	3.64	7.06	0.66	347.74	0.000	40.896	345.80	347.44	1.64**	3.94	6.52	0.66	348.10	0.000	0.000	n/a	0.50	n/a
6	36	25.59	345.90	347.44	1.53	3.64	7.03	0.66	348.10	0.000	57.512	346.25	347.88	1.63**	3.93	6.52	0.66	348.54	0.000	0.000	n/a	0.50	0.33
7	30	25.17	346.35	348.06	1.71*	3.57	7.03	0.77	348.83	0.571	70.340	346.75	348.46	1.71**	3.59	7.02	0.77	349.23	0.568	0.570	0.401	1.35	1.03
8	30	24.08	347.10	349.50	2.40	3.48	4.97	0.74	350.24	0.000	106.739	349.90	351.56 j	1.67**	3.48	6.91	0.74	352.31	0.000	0.000	n/a	1.48	1.10
9	30	22.60	350.05	351.56	1.51	3.11	7.27	0.70	352.27	0.000	130.040	354.30	355.91	1.62**	3.36	6.73	0.70	356.62	0.000	0.000	n/a	2.08	n/a
10	24	11.03	355.20	356.36	1.15*	1.87	5.89	0.50	356.85	0.000	32.501	355.40	356.59	1.19**	1.95	5.66	0.50	357.09	0.000	0.000	n/a	1.80	n/a
11	24	10.47	355.50	356.59	1.09	1.75	5.98	0.48	357.07	0.000	54.556	356.50	357.66	1.16**	1.89	5.55	0.48	358.14	0.000	0.000	n/a	1.47	n/a
12	24	8.91	356.60	357.66	1.06	1.69	5.28	0.43	358.09	0.000	117.471	357.25	358.31	1.06**	1.70	5.25	0.43	358.74	0.000	0.000	n/a	1.55	n/a
13	18	6.63	359.90	360.49	0.59*	0.64	10.37	0.44	360.93	0.000	66.325	362.45	363.44	0.99**	1.24	5.32	0.44	363.89	0.000	0.000	n/a	0.50	n/a
14	15	4.84	362.70	363.44	0.74	0.76	6.34	0.42	363.86	0.000	38.889	363.95	364.84	0.89**	0.94	5.17	0.42	365.26	0.000	0.000	n/a	0.83	0.34
15	15	3.73	364.05	364.84	0.79	0.80	4.55	0.33	365.17	0.000	291.492	367.45	368.23 j	0.78**	0.80	4.63	0.33	368.57	0.000	0.000	n/a	1.50	n/a
16	15	1.86	367.55	368.23	0.68	0.51	2.73	0.21	368.44	0.000	24.500	367.70	368.24	0.54**	0.51	3.65	0.21	368.45	0.000	0.000	n/a	1.00	n/a
17	24	12.48	355.50	356.27	0.77*	1.12	11.15	0.55	356.82	0.000	160.212	360.40	361.66	1.27**	2.10	5.94	0.55	362.21	0.000	0.000	n/a	1.50	n/a
18	18	8.70	361.00	361.85	0.85*	1.03	8.47	0.57	362.41	0.000	167.742	364.10	365.24	1.14**	1.44	6.03	0.57	365.80	0.000	0.000	n/a	1.50	0.85
19	15	5.05	364.50	365.24	0.74	0.75	6.72	0.43	365.67	0.000	158.720	366.80	367.72	0.91**	0.96	5.28	0.43	368.15	0.000	0.000	n/a	1.50	0.65
20	15	2.31	366.90	367.72	0.82	0.59	2.71	0.24	367.95	0.000	32.500	367.10	367.71 j	0.61**	0.59	3.91	0.24	367.95	0.000	0.000	n/a	1.00	n/a
21	15	1.96	364.30	365.24	0.94	0.53	1.98	0.21	365.45	0.000	32.500	364.50	365.06	0.56**	0.53	3.71	0.21	365.27	0.000	0.000	n/a	1.00	n/a
22	15	3.34	357.84	358.58	0.75*	0.75	4.37	0.30	358.88	0.600	43.984	358.10	358.85	0.75**	0.76	4.38	0.30	359.14	0.604	0.602	0.265	1.06	0.32

Project File: Storm System 500.stm | Number of lines: 52 | Run Date: 11/23/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
23	15	3.31	358.20	359.16	0.96	1.01	3.27	0.17	359.33	0.298	24.626	358.35	359.20	0.85	0.89	3.72	0.22	359.41	0.405	0.351	0.087	0.83	0.18
24	15	2.67	358.45	359.38	0.93	0.65	2.73	0.12	359.49	0.211	142.125	359.20	359.86	0.66**	0.65	4.10	0.26	360.12	0.585	0.398	n/a	1.25	n/a
25	15	2.11	359.30	359.86	0.55	0.53	4.01	0.22	360.08	0.000	112.849	363.00	363.58	0.58**	0.56	3.79	0.22	363.80	0.000	0.000	n/a	0.50	n/a
26	15	1.44	363.10	363.58	0.48	0.43	3.34	0.18	363.76	0.000	120.001	363.75	364.23 j	0.47**	0.43	3.37	0.18	364.40	0.000	0.000	n/a	0.50	n/a
27	15	0.82	363.85	364.23	0.37	0.29	2.65	0.13	364.35	0.000	118.109	364.55	364.90	0.35**	0.29	2.86	0.13	365.03	0.000	0.000	n/a	1.00	0.13
28	15	2.21	361.05	361.66	0.61	0.57	3.73	0.23	361.90	0.000	32.507	361.25	361.84	0.59**	0.57	3.85	0.23	362.07	0.000	0.000	n/a	1.00	0.23
29	15	1.43	358.10	358.56	0.46*	0.41	3.52	0.18	358.74	0.000	24.500	358.25	358.72	0.47**	0.43	3.37	0.18	358.90	0.000	0.000	n/a	1.13	n/a
30	15	0.54	358.35	358.72	0.37	0.21	1.75	0.10	358.82	0.000	46.315	359.50	359.79 j	0.29**	0.21	2.55	0.10	359.89	0.000	0.000	n/a	1.00	n/a
31	15	0.51	356.25	356.59	0.34	0.20	1.90	0.10	356.69	0.000	52.252	357.90	358.18 j	0.28**	0.20	2.52	0.10	358.28	0.000	0.000	n/a	1.00	0.10
32	15	1.19	356.25	356.53	0.28*	0.20	5.91	0.16	356.68	0.000	26.744	357.05	357.48	0.43**	0.37	3.18	0.16	357.64	0.000	0.000	n/a	1.00	n/a
33	24	12.12	346.72	347.94	1.22*	2.01	6.02	0.54	348.48	0.000	71.386	347.15	348.40	1.25**	2.07	5.87	0.54	348.93	0.000	0.000	n/a	0.50	n/a
34	24	12.01	347.25	348.50	1.26*	2.05	5.79	0.52	349.02	0.546	74.288	347.65	348.91	1.25**	2.07	5.79	0.52	349.43	0.548	0.547	0.406	1.49	0.78
35	24	11.92	347.75	349.68	1.93	2.04	3.84	0.53	350.21	0.000	32.488	347.95	349.19	1.24**	2.04	5.83	0.53	349.72	0.000	0.000	n/a	1.07	0.57
36	24	10.91	348.05	349.26	1.21*	1.99	5.47	0.47	349.73	0.499	49.900	348.30	349.51	1.21	1.99	5.47	0.47	349.98	0.499	0.499	0.249	1.69	0.79
37	24	9.81	348.40	350.30	1.90	1.81	3.18	0.46	350.76	0.000	101.340	348.95	350.07	1.12**	1.81	5.42	0.46	350.52	0.000	0.000	n/a	0.92	n/a
38	24	9.87	349.05	350.13	1.08*	1.74	5.67	0.46	350.59	0.000	52.810	349.35	350.48	1.12**	1.82	5.43	0.46	350.93	0.000	0.000	n/a	2.02	0.93
39	15	1.24	353.15	353.41	0.26*	0.18	6.85	0.16	353.57	0.000	52.750	355.45	355.89	0.44**	0.38	3.22	0.16	356.05	0.000	0.000	n/a	1.29	n/a
40	15	0.61	355.55	355.89	0.34	0.23	2.28	0.11	356.00	0.000	24.500	355.70	356.00	0.30**	0.23	2.64	0.11	356.11	0.000	0.000	n/a	1.00	0.11
41	24	8.83	349.45	350.49	1.04*	1.65	5.36	0.42	350.92	0.000	176.240	350.40	351.46	1.06**	1.69	5.23	0.42	351.88	0.000	0.000	n/a	0.55	0.23
42	18	5.42	350.90	351.73	0.83*	1.00	5.40	0.38	352.11	0.000	78.654	351.50	352.40	0.90**	1.10	4.92	0.38	352.77	0.000	0.000	n/a	0.69	n/a
43	15	4.28	351.75	352.40	0.65	0.64	6.69	0.37	352.77	0.000	86.876	353.80	354.64	0.84**	0.87	4.90	0.37	355.01	0.000	0.000	n/a	0.74	0.28
44	15	2.74	353.90	354.64	0.74	0.66	3.63	0.27	354.90	0.000	92.700	356.60	357.26 j	0.66**	0.66	4.14	0.27	357.53	0.000	0.000	n/a	1.00	n/a

Project File: Storm System 500.stm | Number of lines: 52 | Run Date: 11/23/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

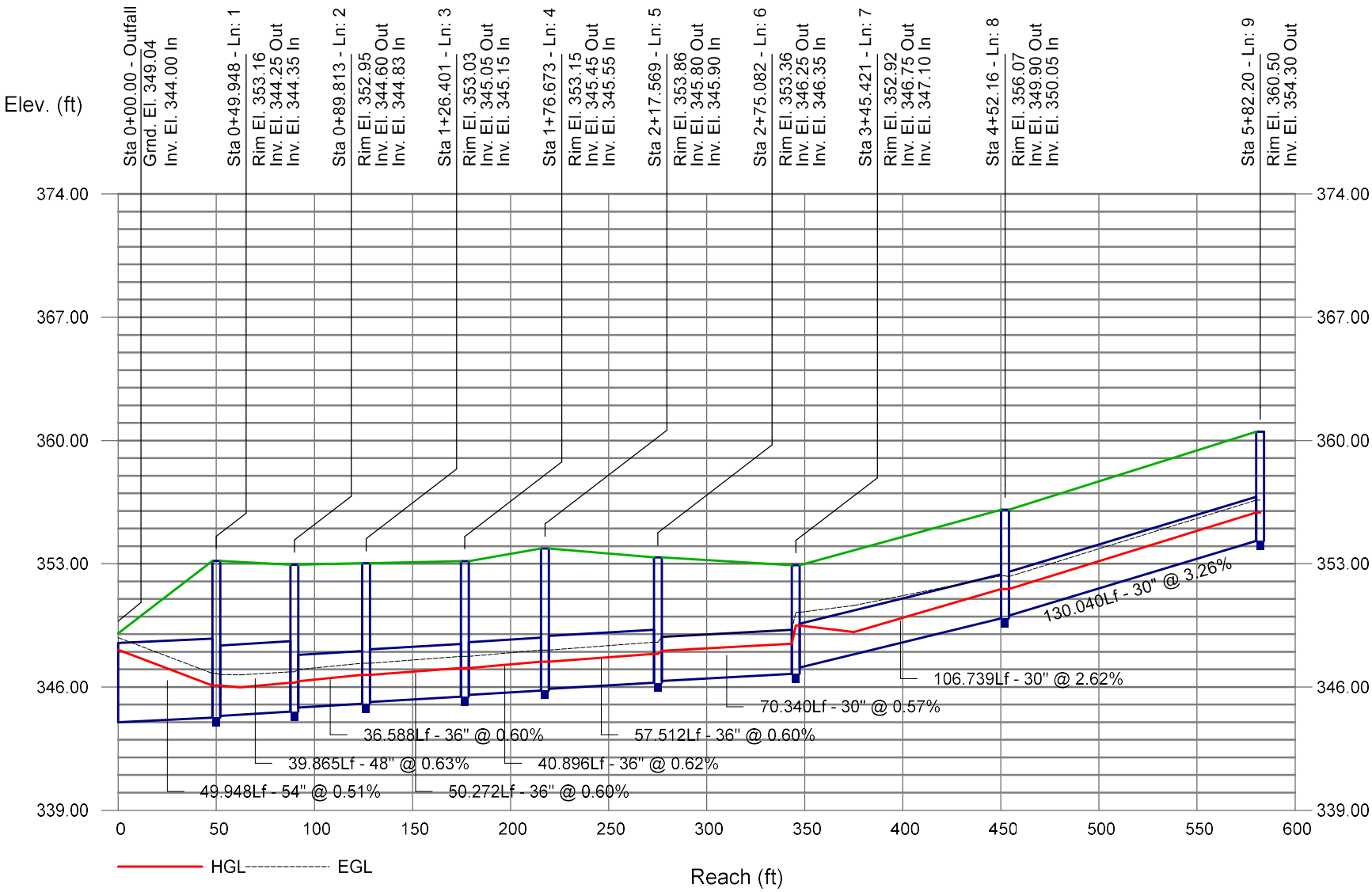
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
45	15	0.89	351.60	351.95	0.35*	0.29	3.14	0.13	352.08	0.000	32.503	351.80	352.17	0.37**	0.30	2.93	0.13	352.30	0.000	0.000	n/a	1.00	0.13
46	15	1.12	350.50	350.91	0.40*	0.34	3.29	0.15	351.06	0.000	24.260	350.65	351.07	0.42**	0.36	3.13	0.15	351.22	0.000	0.000	n/a	1.00	0.15
47	15	0.55	348.40	349.50	1.10	0.21	0.48	0.10	349.60	0.000	39.995	348.65	348.94	0.29**	0.21	2.56	0.10	349.04	0.000	0.000	n/a	1.00	n/a
48	24	6.29	344.80	346.24	1.44	1.35	2.60	0.34	346.58	0.000	45.564	345.05	345.93	0.89**	1.35	4.67	0.34	346.27	0.000	0.000	n/a	1.10	n/a
49	18	6.22	345.30	346.29	1.00*	1.25	4.98	0.39	346.68	0.575	121.617	346.00	346.99	1.00	1.25	4.98	0.39	347.38	0.573	0.574	0.698	1.18	0.45
50	18	5.62	346.10	347.45	1.35	1.13	3.35	0.39	347.84	0.000	39.979	346.40	347.31	0.91**	1.13	4.99	0.39	347.70	0.000	0.000	n/a	1.37	n/a
51	15	5.03	346.70	347.81	1.11*	1.15	4.36	0.30	348.10	0.539	65.834	347.05	348.16	1.11	1.15	4.36	0.30	348.46	0.540	0.539	0.355	0.50	0.15
52	15	3.37	347.15	348.31	1.16	1.19	2.84	0.13	348.44	0.236	59.959	347.45	348.43	0.98	1.03	3.26	0.17	348.60	0.297	0.266	0.160	1.00	0.17

Project File: Storm System 500.stm | Number of lines: 52 | Run Date: 11/23/2020

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

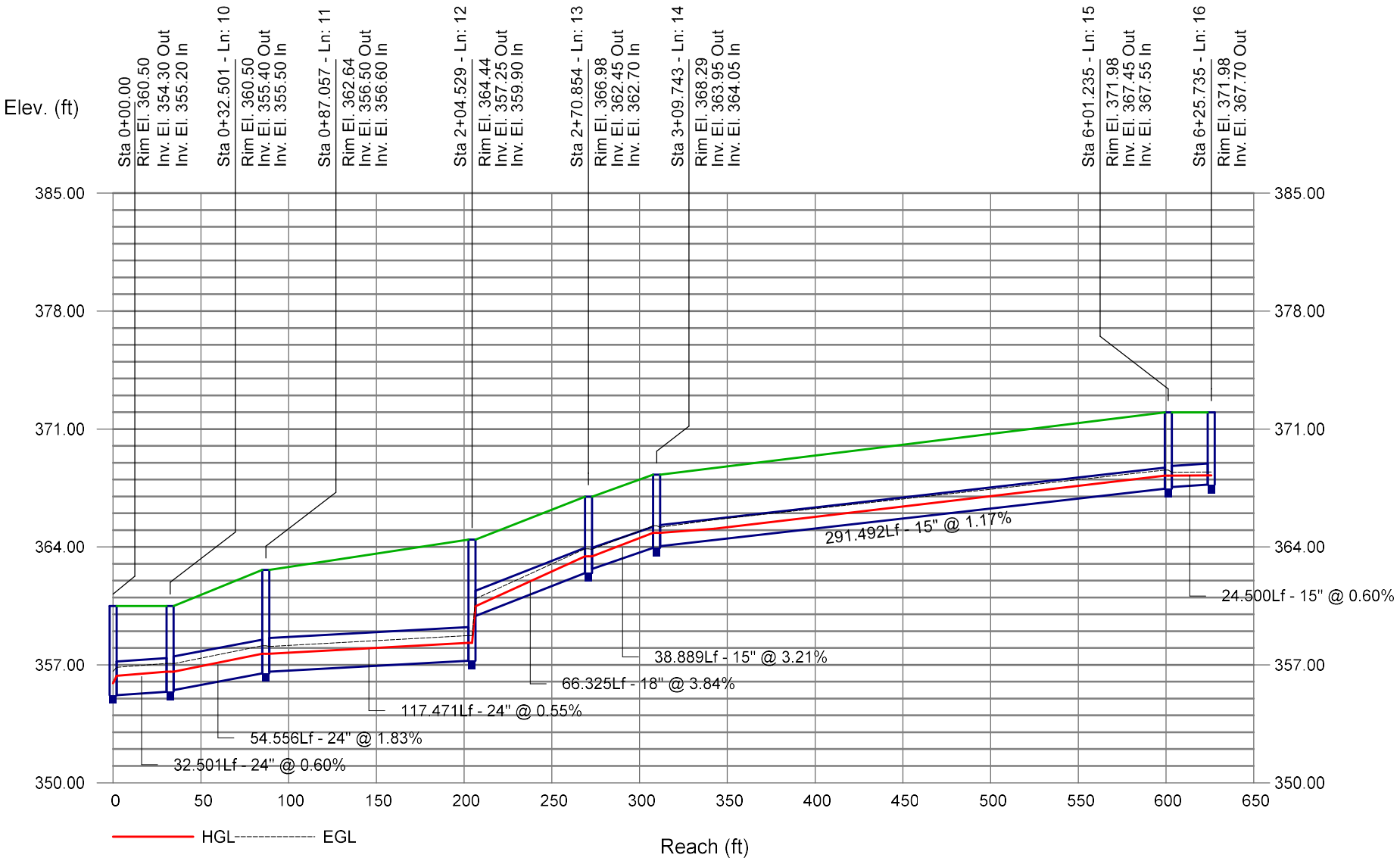
Storm Sewer Profile

Proj. file: Storm System 500.stm



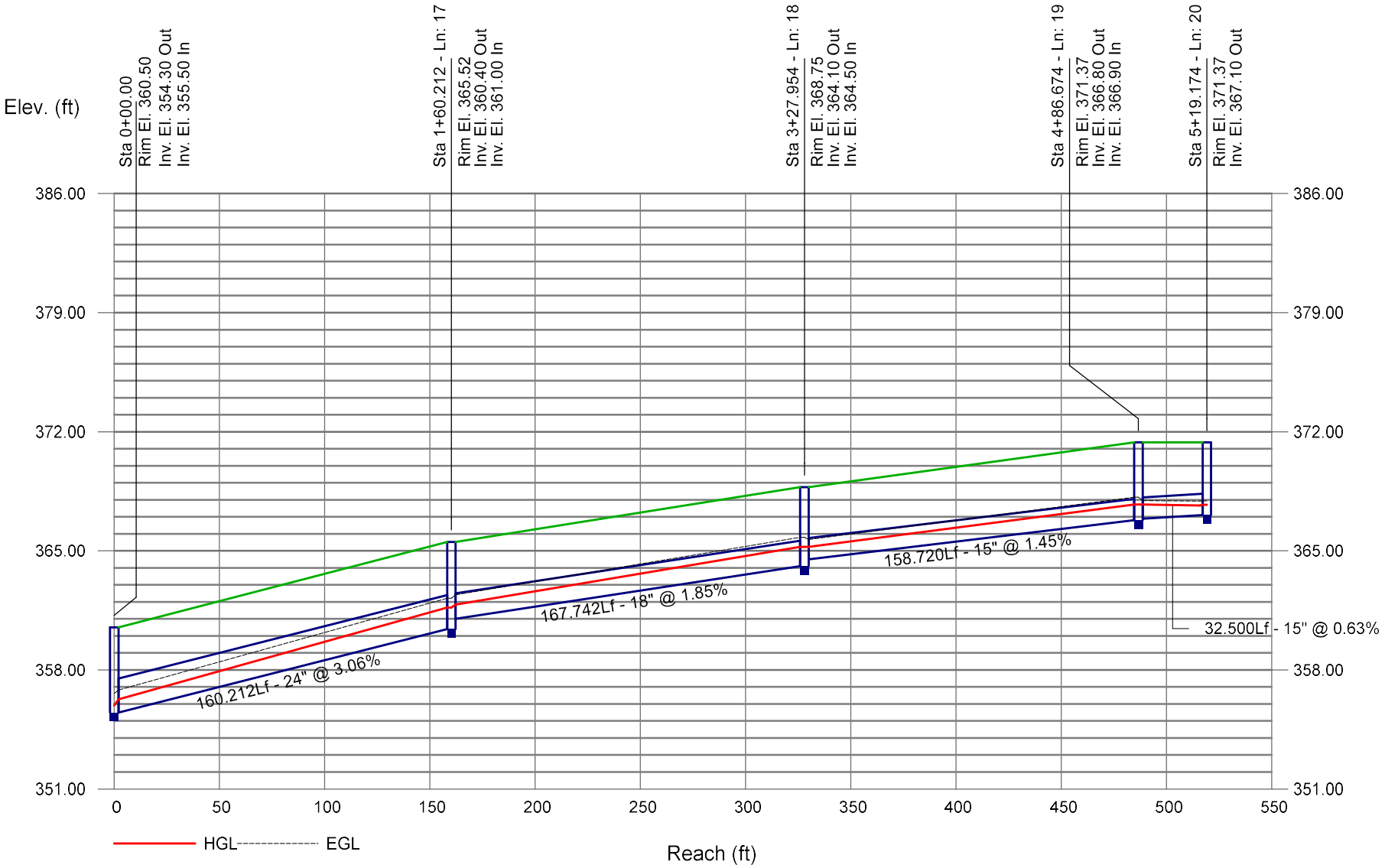
Storm Sewer Profile

Proj. file: Storm System 500.stm



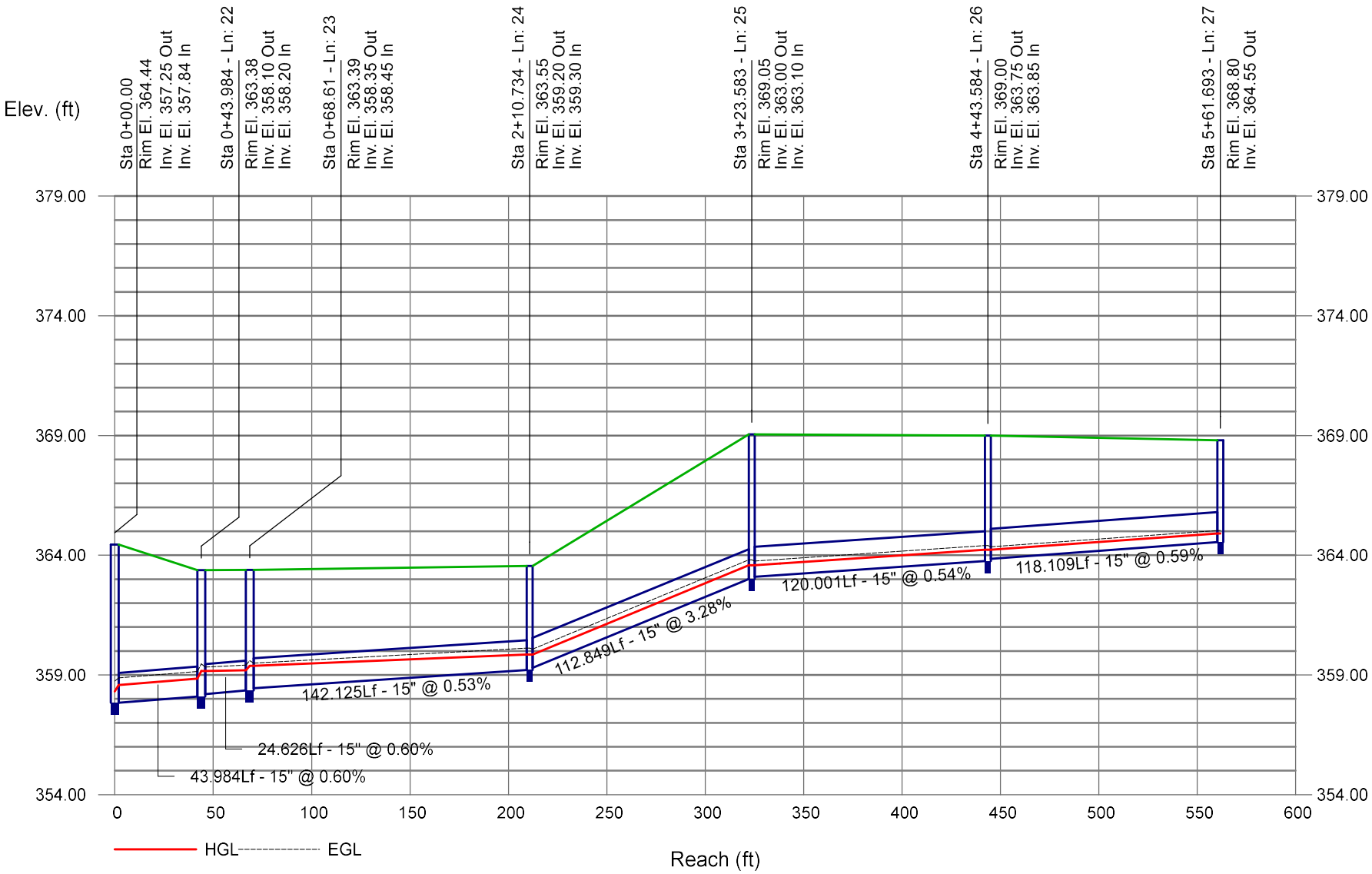
Storm Sewer Profile

Proj. file: Storm System 500.stm



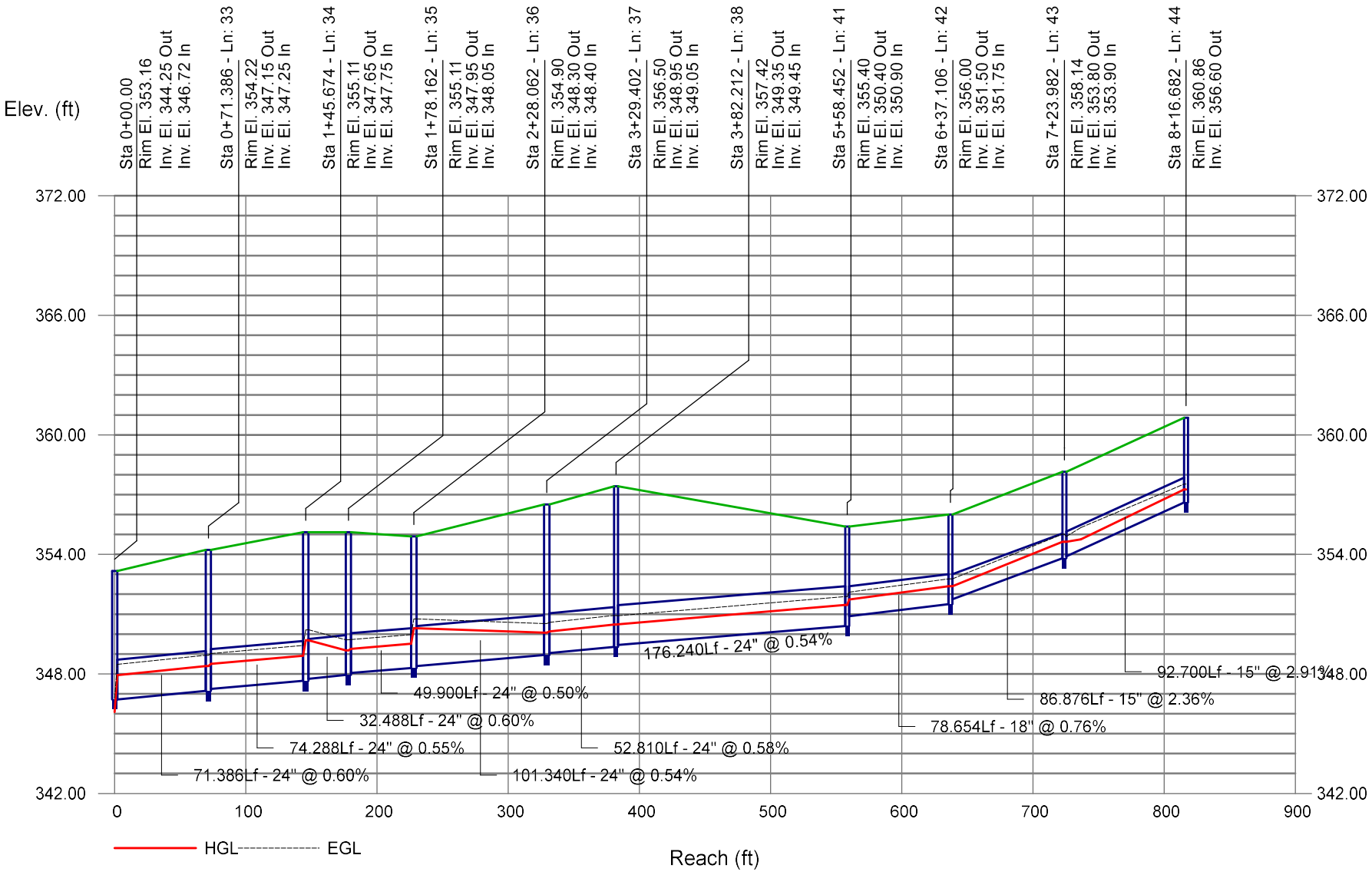
Storm Sewer Profile

Proj. file: Storm System 500.stm



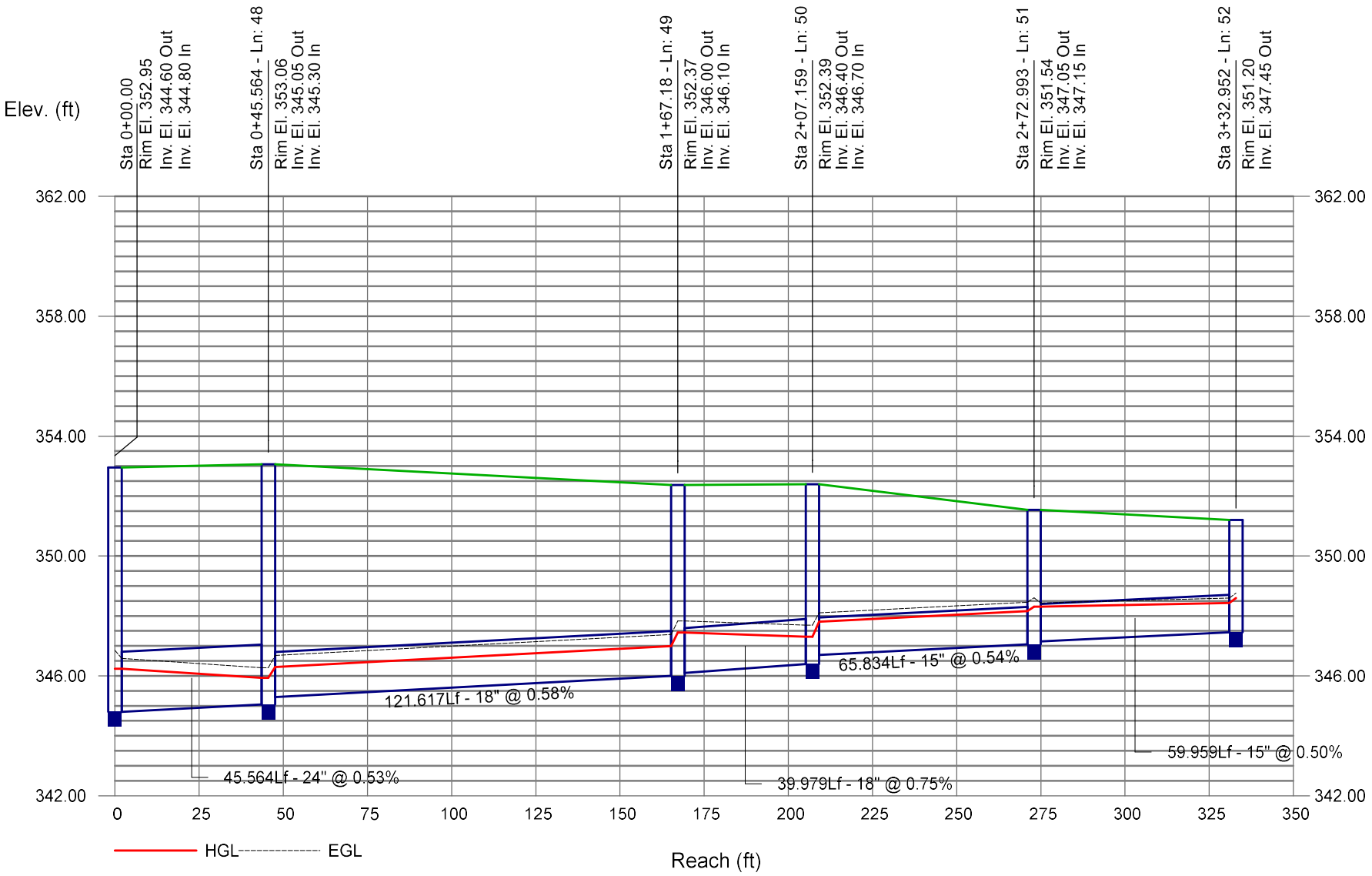
Storm Sewer Profile

Proj. file: Storm System 500.stm



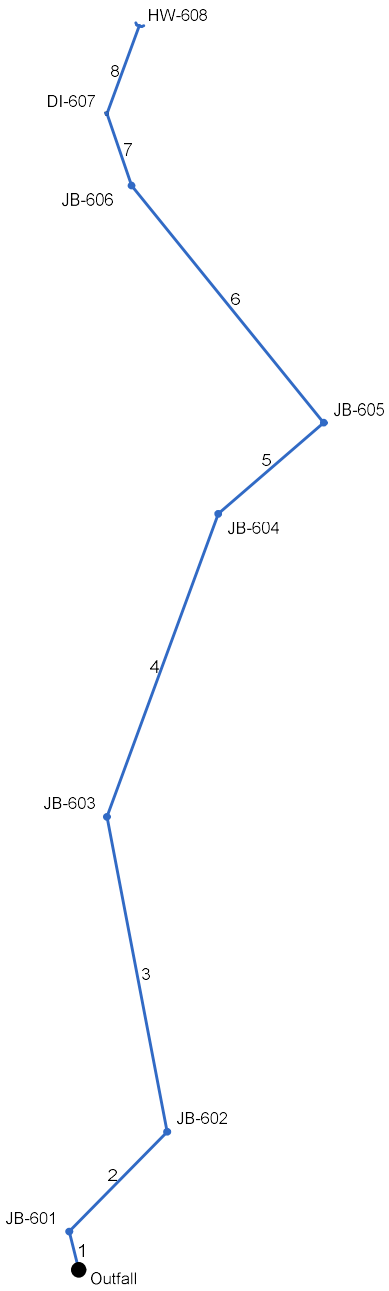
Storm Sewer Profile

Proj. file: Storm System 500.stm



SYSTEM 600 – REPORTS AND PROFILES

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: Storm System 600 - Bypass 1.stm	Number of lines: 8	Date: 11/23/2020

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	600-601	33.61	36	Cir	32.545	340.70	340.86	0.500	342.57	342.74	n/a	342.74	End	Manhole
2	601-602	34.23	36	Cir	115.112	340.95	341.55	0.517	342.82	343.44	0.70	343.44	1	Manhole
3	602-603	35.20	30	Cir	264.599	341.65	343.35	0.644	343.92	345.63	0.50	346.13	2	Manhole
4	603-604	36.19	30	Cir	266.275	347.50	349.90	0.902	349.41	351.94	n/a	351.94	3	Manhole
5	604-605	36.63	30	Cir	114.903	350.00	351.85	1.614	351.94	353.90	n/a	353.90	4	Manhole
6	605-606	37.56	30	Cir	251.548	351.95	354.05	0.834	354.01	356.12	n/a	356.12	5	Manhole
7	606-607	37.80	30	Cir	62.811	354.80	355.40	0.955	356.73	357.48	1.18	357.48	6	DropGrate
8	607-608	37.55	30	Cir	77.098	356.40	360.15	4.864	357.52	362.22	1.16	362.22	7	OpenHeadwall

Project File: Storm System 600 - Bypass 1.stm

Number of lines: 8

Run Date: 11/23/2020

NOTES: Return period = 10 Yrs.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	32.545	0.00	10.64	0.00	0.00	5.30	0.0	7.9	6.3	33.61	47.15	7.22	36	0.50	340.70	340.86	342.57	342.74	345.50	346.50	600-601
2	1	115.112	0.00	10.64	0.00	0.00	5.30	0.0	7.5	6.5	34.23	47.97	7.31	36	0.52	340.95	341.55	342.82	343.44	346.50	347.50	601-602
3	2	264.599	0.00	10.64	0.00	0.00	5.30	0.0	6.8	6.6	35.20	32.90	7.51	30	0.64	341.65	343.35	343.92	345.63	347.50	354.00	602-603
4	3	266.275	0.00	10.64	0.00	0.00	5.30	0.0	6.1	6.8	36.19	38.95	8.73	30	0.90	347.50	349.90	349.41	351.94	354.00	364.00	603-604
5	4	114.903	0.00	10.64	0.00	0.00	5.30	0.0	5.9	6.9	36.63	52.10	8.73	30	1.61	350.00	351.85	351.94	353.90	364.00	363.48	604-605
6	5	251.548	0.00	10.64	0.00	0.00	5.30	0.0	5.3	7.1	37.56	37.45	8.67	30	0.83	351.95	354.05	354.01	356.12	363.48	364.50	605-606
7	6	62.811	0.19	10.64	0.40	0.08	5.30	5.0	5.2	7.1	37.80	40.08	8.98	30	0.95	354.80	355.40	356.73	357.48	364.50	361.86	606-607
8	7	77.098	10.45	10.45	0.50	5.23	5.23	5.0	5.0	7.2	37.55	90.45	13.10	30	4.86	356.40	360.15	357.52	362.22	361.86	364.65	607-608

Project File: Storm System 600 - Bypass 1.stm

Number of lines: 8

Run Date: 11/23/2020

NOTES:Intensity = 67.84 / (Inlet time + 12.00) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

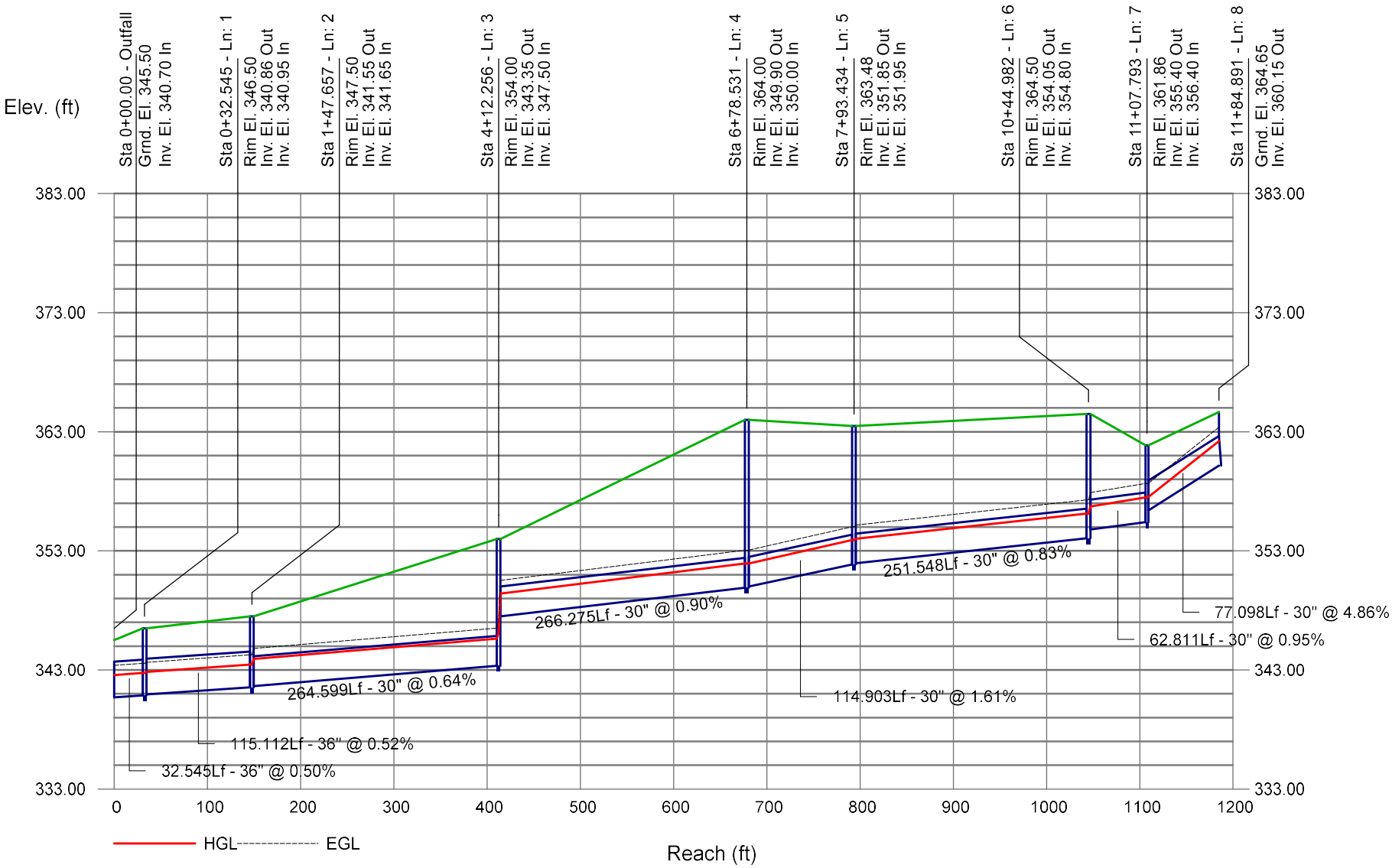
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	36	33.61	340.70	342.57	1.87	4.64	7.24	0.81	343.38	0.000	32.545	340.86	342.74	1.88**	4.66	7.21	0.81	343.55	0.000	0.000	n/a	0.87	n/a
2	36	34.23	340.95	342.82	1.87*	4.64	7.37	0.82	343.64	0.000	115.112	341.55	343.44	1.90**	4.72	7.26	0.82	344.26	0.000	0.000	n/a	0.85	0.70
3	30	35.20	341.65	343.92	2.27*	4.69	7.51	0.88	344.80	0.644	264.599	343.35	345.63	2.28	4.69	7.51	0.88	346.50	0.643	0.643	1.703	0.57	0.50
4	30	36.19	347.50	349.41	1.91*	4.02	9.01	1.11	350.52	0.000	266.275	349.90	351.94	2.04**	4.28	8.45	1.11	353.05	0.000	0.000	n/a	0.54	n/a
5	30	36.63	350.00	351.94	1.94	4.09	8.96	1.12	353.06	0.000	114.903	351.85	353.90	2.05**	4.31	8.51	1.12	355.03	0.000	0.000	n/a	1.00	n/a
6	30	37.56	351.95	354.01	2.06*	4.32	8.70	1.16	355.17	0.000	251.548	354.05	356.12	2.07**	4.35	8.64	1.16	357.28	0.000	0.000	n/a	0.40	n/a
7	30	37.80	354.80	356.73	1.93*	4.07	9.28	1.17	357.90	0.000	62.811	355.40	357.48	2.08**	4.36	8.67	1.17	358.65	0.000	0.000	n/a	1.01	1.18
8	30	37.55	356.40	357.52	1.12*	2.14	17.57	1.16	358.68	0.000	77.098	360.15	362.22	2.07**	4.35	8.63	1.16	363.38	0.000	0.000	n/a	1.00	1.16

Project File: Storm System 600 - Bypass 1.stm | Number of lines: 8 | Run Date: 11/23/2020

Notes: * Normal depth assumed; ** Critical depth. ; c = cir e = ellip b = box

Storm Sewer Profile

Proj. file: Storm System 600 - Bypass 1.stm



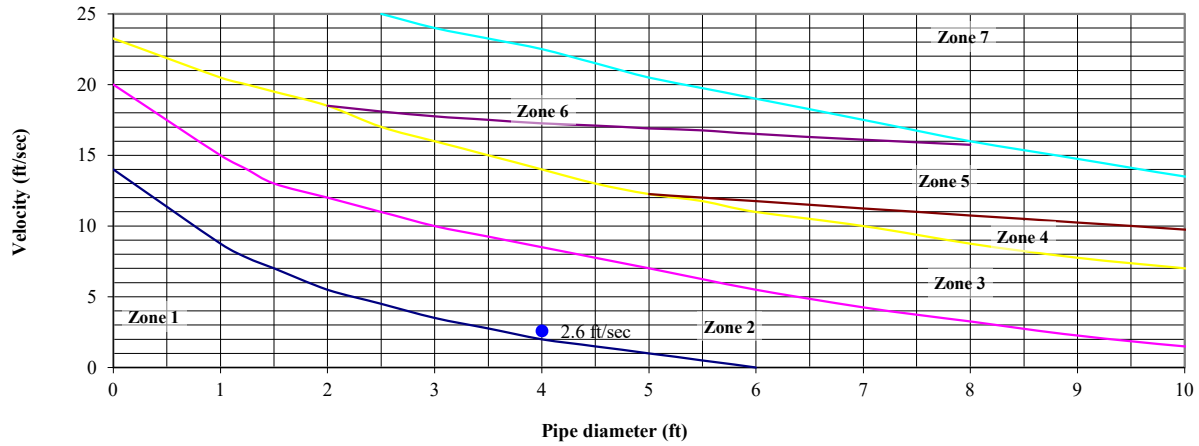
VELOCITY DISSIPATOR CALCULATIONS

DESIGN OF RIPRAP OUTLET PROTECTION WORKSHEET

Project:	The Point South - Pkg 1	Date:	11/20/2020
Project Number:	AWH-20000	Calculated By:	WTO
Outlet Number:	EW-100		

Outlet flowrate =	32.21	cfs
Pipe diameter =	48	inches
Number of pipes =	1	
Pipe separation =	0	feet
Outlet Velocity =	2.58	ft/sec

Figure 8.06.b.1



Zone from graph above = 2

Outlet pipe diameter	48 in.	Length =	24.0 ft.
Outlet flowrate	32.2 cfs	Width =	13.6 ft.
Outlet velocity	2.6 ft/sec	Stone diameter =	6 in.
Material =	Class B	Thickness =	18 in.

Zone	Material	Diameter	Thickness	Length	Width
1	Class A	3	12	4 x D(o)	3 x D(o)
2	Class B	6	18	6 x D(o)	3 x D(o)
3	Class I	13	24	8 x D(o)	3 x D(o)
4	Class I	13	24	8 x D(o)	3 x D(o)
5	Class II	23	36	10 x D(o)	3 x D(o)
6	Class II	23	36	10 x D(o)	3 x D(o)
7	Special study required				

1. Calculations based on NY DOT method - Pages 8.06.05 through 8.06.06 in NC Erosion Control Manual

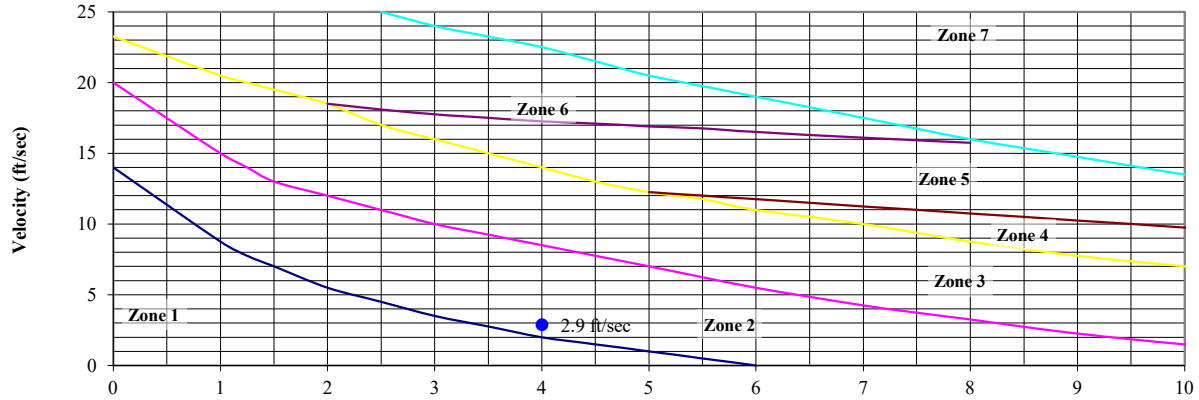
2. Outlet velocity based on full-flow velocity

DESIGN OF RIPRAP OUTLET PROTECTION WORKSHEET

Project:	The Point South - Pkg 1	Date:	11/20/2020
Project Number:	AWH-20000	Calculated By:	WTO
Outlet Number:	EW-200		

Outlet flowrate =	36.2	cfs
Pipe diameter =	48	inches
Number of pipes =	1	
Pipe separation =	0	feet
Outlet Velocity =	2.88	ft/sec

Figure 8.06.b.1



Zone from graph above = 2

Outlet pipe diameter	48 in.	Length =	24.0 ft.
Outlet flowrate	36.2 cfs	Width =	13.6 ft.
Outlet velocity	2.9 ft/sec	Stone diameter =	6 in.
Material =	Class B	Thickness =	18 in.

Zone	Material	Diameter	Thickness	Length	Width
1	Class A	3	12	4 x D(o)	3 x D(o)
2	Class B	6	18	6 x D(o)	3 x D(o)
3	Class I	13	24	8 x D(o)	3 x D(o)
4	Class I	13	24	8 x D(o)	3 x D(o)
5	Class II	23	36	10 x D(o)	3 x D(o)
6	Class II	23	36	10 x D(o)	3 x D(o)
7	Special study required				

1. Calculations based on NY DOT method - Pages 8.06.05 through 8.06.06 in NC Erosion Control Manual

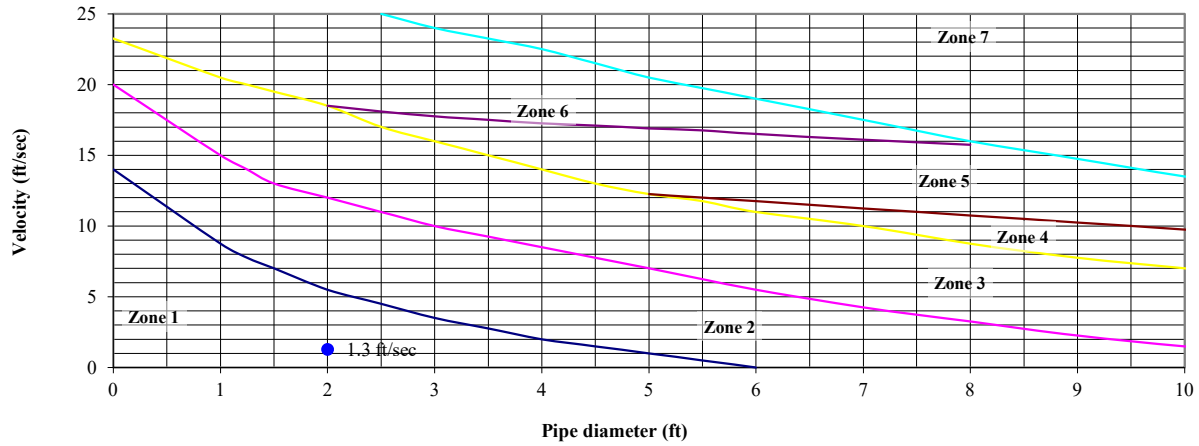
2. Outlet velocity based on full-flow velocity

DESIGN OF RIPRAP OUTLET PROTECTION WORKSHEET

Project:	The Point South - Pkg 1	Date:	11/20/2020
Project Number:	AWH-20000	Calculated By:	WTO
Outlet Number:	EW-248		

Outlet flowrate =	4.01	cfs
Pipe diameter =	24	inches
Number of pipes =	1	
Pipe separation =	0	feet
Outlet Velocity =	1.28	ft/sec

Figure 8.06.b.1



Zone from graph above = 2 *Selecting Zone 2 for Class "B" Riprap*

Outlet pipe diameter	24 in.	Length =	12.0 ft.
Outlet flowrate	4.0 cfs	Width =	6.8 ft.
Outlet velocity	1.3 ft/sec	Stone diameter =	6 in.
Material =	Class B	Thickness =	18 in.

Zone	Material	Diameter	Thickness	Length	Width
1	Class A	3	12	4 x D(o)	3 x D(o)
2	Class B	6	18	6 x D(o)	3 x D(o)
3	Class I	13	24	8 x D(o)	3 x D(o)
4	Class I	13	24	8 x D(o)	3 x D(o)
5	Class II	23	36	10 x D(o)	3 x D(o)
6	Class II	23	36	10 x D(o)	3 x D(o)
7	Special study required				

1. Calculations based on NY DOT method - Pages 8.06.05 through 8.06.06 in NC Erosion Control Manual

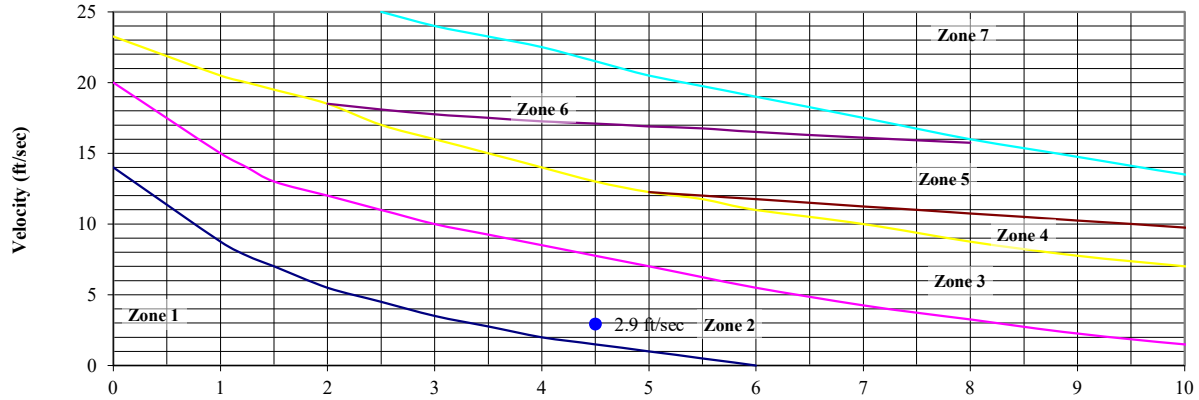
2. Outlet velocity based on full-flow velocity

DESIGN OF RIPRAP OUTLET PROTECTION WORKSHEET

Project:	The Point South - Pkg 1	Date:	11/20/2020
Project Number:	AWH-20000	Calculated By:	WTO
Outlet Number:	EW-300		

Outlet flowrate =	46.61	cfs
Pipe diameter =	54	inches
Number of pipes =	1	
Pipe separation =	0	feet
Outlet Velocity =	2.94	ft/sec

Figure 8.06.b.1



Zone from graph above = 2

Outlet pipe diameter	54 in.	Length =	27.0 ft.
Outlet flowrate	46.6 cfs	Width =	15.3 ft.
Outlet velocity	2.9 ft/sec	Stone diameter =	6 in.
Material =	Class B	Thickness =	18 in.

Zone	*Material*	*Diameter*	*Thickness*	*Length*	*Width*
1	*Class A*	*3*	*12*	*4 x D(o)*	*3 x D(o)*
2	*Class B*	*6*	*18*	*6 x D(o)*	*3 x D(o)*
3	*Class I*	*13*	*24*	*8 x D(o)*	*3 x D(o)*
4	*Class I*	*13*	*24*	*8 x D(o)*	*3 x D(o)*
5	*Class II*	*23*	*36*	*10 x D(o)*	*3 x D(o)*
6	*Class II*	*23*	*36*	*10 x D(o)*	*3 x D(o)*
7	*Special study required*				

1. Calculations based on NY DOT method - Pages 8.06.05 through 8.06.06 in NC Erosion Control Manual

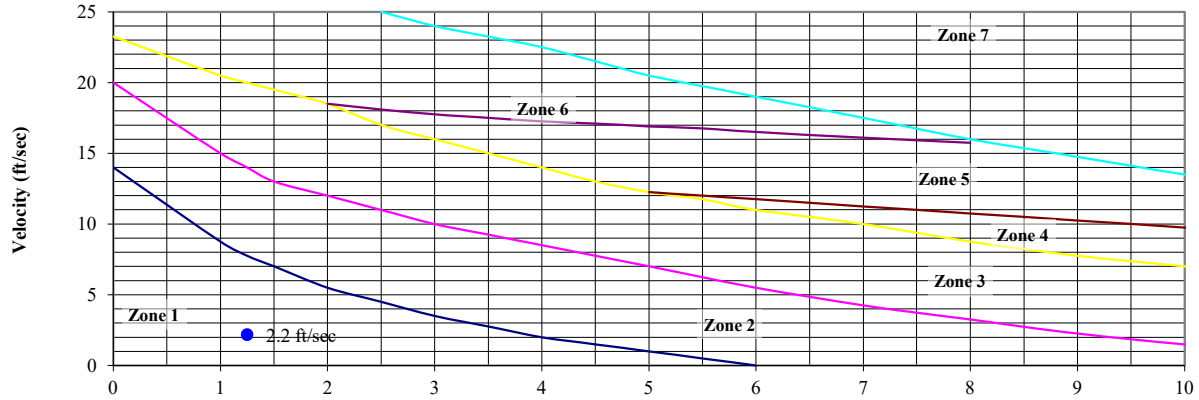
2. Outlet velocity based on full-flow velocity

DESIGN OF RIPRAP OUTLET PROTECTION WORKSHEET

Project:	The Point South - Pkg 1	Date:	11/20/2020
Project Number:	AWH-20000	Calculated By:	WTO
Outlet Number:	EW-366		

Outlet flowrate =	2.68	cfs
Pipe diameter =	15	inches
Number of pipes =	1	
Pipe separation =	0	feet
Outlet Velocity =	2.18	ft/sec

Figure 8.06.b.1



Zone from graph above = 2 *Selecting Zone 2 for Class "B" Riprap*

Outlet pipe diameter	15 in.	Length =	7.5 ft.
Outlet flowrate	2.7 cfs	Width =	4.3 ft.
Outlet velocity	2.2 ft/sec	Stone diameter =	6 in.
Material =	Class B	Thickness =	18 in.

Zone	Material	Diameter	Thickness	Length	Width
1	Class A	3	12	4 x D(o)	3 x D(o)
2	Class B	6	18	6 x D(o)	3 x D(o)
3	Class I	13	24	8 x D(o)	3 x D(o)
4	Class I	13	24	8 x D(o)	3 x D(o)
5	Class II	23	36	10 x D(o)	3 x D(o)
6	Class II	23	36	10 x D(o)	3 x D(o)
7	Special study required				

1. Calculations based on NY DOT method - Pages 8.06.05 through 8.06.06 in NC Erosion Control Manual

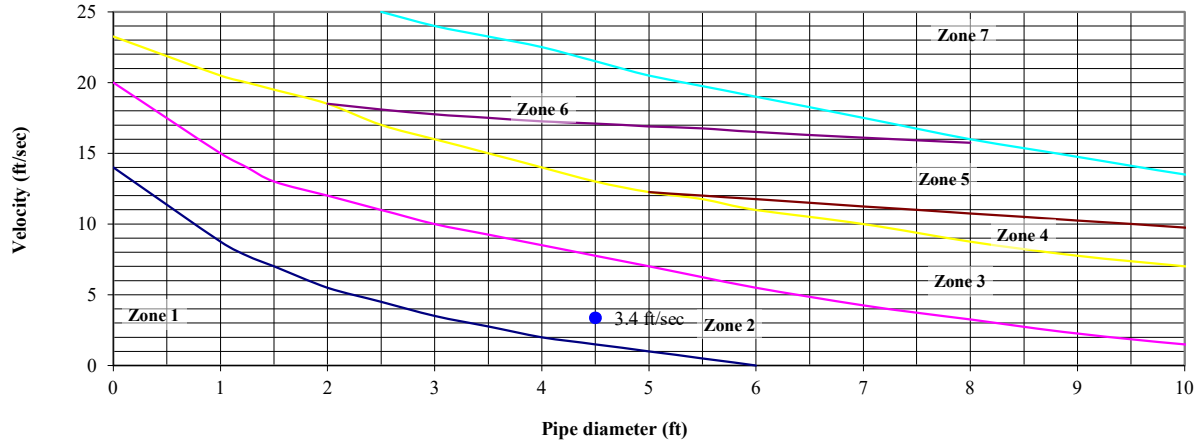
2. Outlet velocity based on full-flow velocity

DESIGN OF RIPRAP OUTLET PROTECTION WORKSHEET

Project:	The Point South - Pkg 1	Date:	11/20/2020
Project Number:	AWH-20000	Calculated By:	WTO
Outlet Number:	EW-400		

Outlet flowrate =	50.87	cfs
Pipe diameter =	54	inches
Number of pipes =	1	
Pipe separation =	0	feet
Outlet Velocity =	3.36	ft/sec

Figure 8.06.b.1



Zone from graph above = 2

Outlet pipe diameter	54 in.	Length =	27.0 ft.
Outlet flowrate	50.9 cfs	Width =	15.3 ft.
Outlet velocity	3.4 ft/sec	Stone diameter =	6 in.
Material =	Class B	Thickness =	18 in.

Zone	Material	Diameter	Thickness	Length	Width
1	Class A	3	12	4 x D(o)	3 x D(o)
2	Class B	6	18	6 x D(o)	3 x D(o)
3	Class I	13	24	8 x D(o)	3 x D(o)
4	Class I	13	24	8 x D(o)	3 x D(o)
5	Class II	23	36	10 x D(o)	3 x D(o)
6	Class II	23	36	10 x D(o)	3 x D(o)
7	Special study required				

1. Calculations based on NY DOT method - Pages 8.06.05 through 8.06.06 in NC Erosion Control Manual

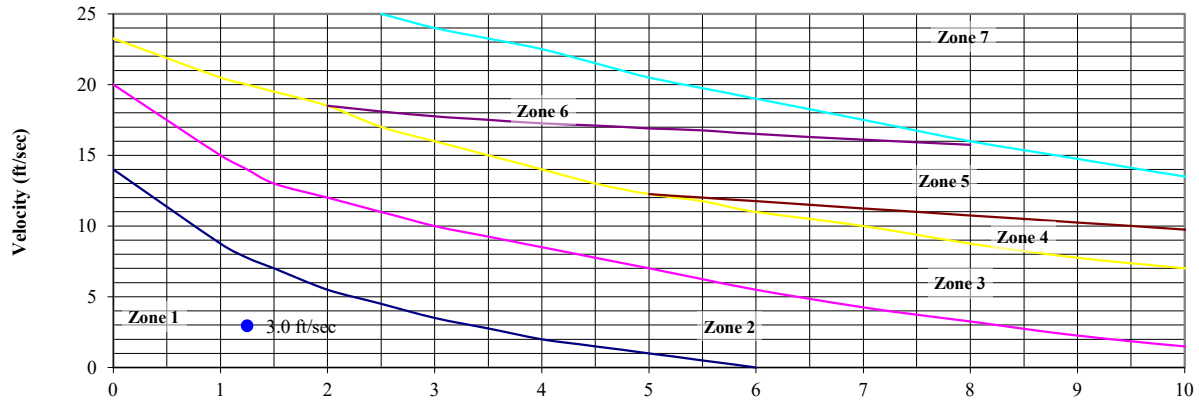
2. Outlet velocity based on full-flow velocity

DESIGN OF RIPRAP OUTLET PROTECTION WORKSHEET

Project:	The Point South - Pkg 1	Date:	11/20/2020
Project Number:	AWH-20000	Calculated By:	WTO
Outlet Number:	EW-471		

Outlet flowrate =	3.63	cfs
Pipe diameter =	15	inches
Number of pipes =	1	
Pipe separation =	0	feet
Outlet Velocity =	2.96	ft/sec

Figure 8.06.b.1



Zone from graph above = 2 *Selecting Zone 2 for Class "B" Riprap*

Outlet pipe diameter	15 in.	Length =	7.5 ft.
Outlet flowrate	3.6 cfs	Width =	4.3 ft.
Outlet velocity	3.0 ft/sec	Stone diameter =	6 in.
Material =	Class B	Thickness =	18 in.

Zone	Material	Diameter	Thickness	Length	Width
1	Class A	3	12	4 x D(o)	3 x D(o)
2	Class B	6	18	6 x D(o)	3 x D(o)
3	Class I	13	24	8 x D(o)	3 x D(o)
4	Class I	13	24	8 x D(o)	3 x D(o)
5	Class II	23	36	10 x D(o)	3 x D(o)
6	Class II	23	36	10 x D(o)	3 x D(o)
7	Special study required				

1. Calculations based on NY DOT method - Pages 8.06.05 through 8.06.06 in NC Erosion Control Manual

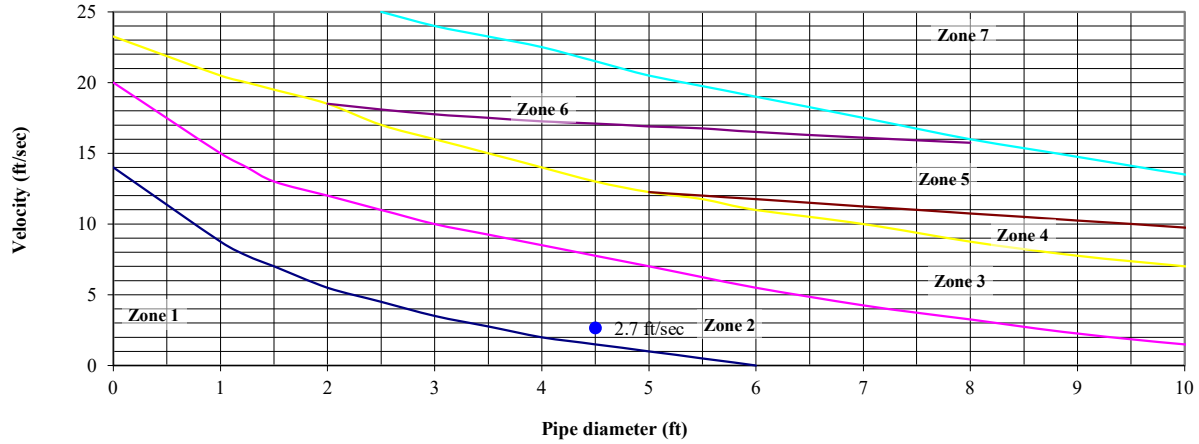
2. Outlet velocity based on full-flow velocity

DESIGN OF RIPRAP OUTLET PROTECTION WORKSHEET

Project:	The Point South - Pkg 1	Date:	11/20/2020
Project Number:	AWH-20000	Calculated By:	WTO
Outlet Number:	EW-500		

Outlet flowrate =	40.5	cfs
Pipe diameter =	54	inches
Number of pipes =	1	
Pipe separation =	0	feet
Outlet Velocity =	2.65	ft/sec

Figure 8.06.b.1



Zone from graph above = 2

Selecting Zone 2 for Class "B" Riprap

Outlet pipe diameter	54 in.	Length =	27.0 ft.
Outlet flowrate	40.5 cfs	Width =	15.3 ft.
Outlet velocity	2.7 ft/sec	Stone diameter =	6 in.
Material =	Class B	Thickness =	18 in.

Zone	Material	Diameter	Thickness	Length	Width
1	Class A	3	12	4 x D(o)	3 x D(o)
2	Class B	6	18	6 x D(o)	3 x D(o)
3	Class I	13	24	8 x D(o)	3 x D(o)
4	Class I	13	24	8 x D(o)	3 x D(o)
5	Class II	23	36	10 x D(o)	3 x D(o)
6	Class II	23	36	10 x D(o)	3 x D(o)
7	Special study required				

1. Calculations based on NY DOT method - Pages 8.06.05 through 8.06.06 in NC Erosion Control Manual

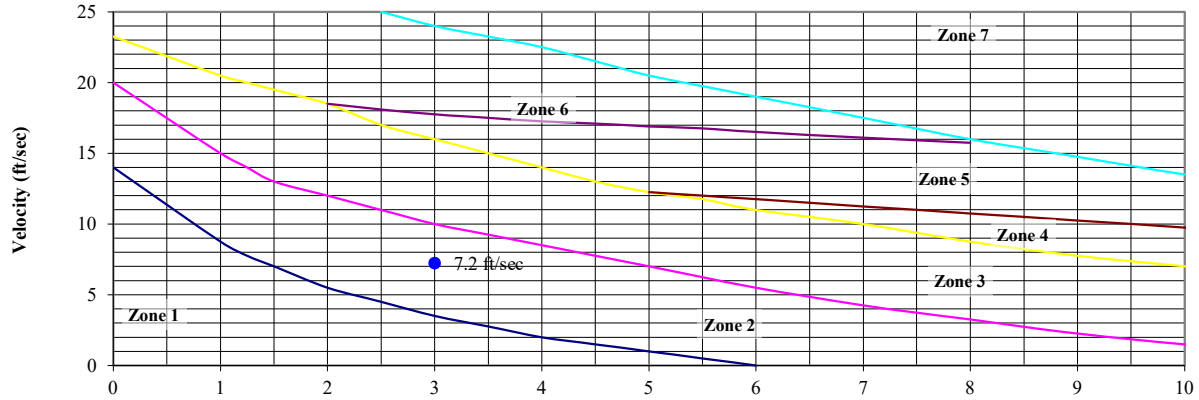
2. Outlet velocity based on full-flow velocity

DESIGN OF RIPRAP OUTLET PROTECTION WORKSHEET

Project:	The Point South - Pkg 1	Date:	11/20/2020
Project Number:	AWH-20000	Calculated By:	WTO
Outlet Number:	EW-600		

Outlet flowrate =	33.61	cfs
Pipe diameter =	36	inches
Number of pipes =	1	
Pipe separation =	0	feet
Outlet Velocity =	7.24	ft/sec

Figure 8.06.b.1



Zone from graph above = 2 *Selecting Zone 2 for Class "B" Riprap*

Outlet pipe diameter	36 in.	Length =	18.0 ft.
Outlet flowrate	33.6 cfs	Width =	10.2 ft.
Outlet velocity	7.2 ft/sec	Stone diameter =	6 in.
Material =	Class B	Thickness =	18 in.

Zone	Material	Diameter	Thickness	Length	Width
1	Class A	3	12	4 x D(o)	3 x D(o)
2	Class B	6	18	6 x D(o)	3 x D(o)
3	Class I	13	24	8 x D(o)	3 x D(o)
4	Class I	13	24	8 x D(o)	3 x D(o)
5	Class II	23	36	10 x D(o)	3 x D(o)
6	Class II	23	36	10 x D(o)	3 x D(o)
7	Special study required				

1. Calculations based on NY DOT method - Pages 8.06.05 through 8.06.06 in NC Erosion Control Manual

2. Outlet velocity based on full-flow velocity

INLET/GUTTER SPREAD REPORTS

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	CB-101	0.32	0.00	0.32	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.10	2.95	0.23	0.53	2.5	Off
2	CB-102	0.73	0.07	0.69	0.11	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.14	4.80	0.28	1.62	2.5	43
3	CB-105	0.66	0.00	0.59	0.07	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.13	4.38	0.27	1.37	2.5	2
4	CB-106	0.17	0.00	0.17	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.08	1.92	0.21	0.00	2.5	3
5	CB-108	0.17	0.00	0.17	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.08	1.92	0.21	0.00	2.5	4
6	CB-109	0.17	0.01	0.17	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.08	1.94	0.21	0.00	2.5	5
7	CB-111	0.30	0.00	0.30	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.10	2.82	0.23	0.45	2.5	42
8	CB-112	0.07	0.00	0.07	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.012	2.00	0.042	0.020	0.013	0.06	1.50	0.21	0.00	2.5	7
9	CB-126	0.03	0.00	0.03	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.007	2.00	0.042	0.020	0.013	0.05	1.17	0.21	0.00	2.5	8
10	CB-127	0.26	0.00	0.25	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.10	2.69	0.22	0.37	2.5	11
11	CB-129	0.26	0.00	0.26	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.09	2.52	0.22	0.25	2.5	Off
12	CB-130	0.81	0.06	0.75	0.13	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.14	4.97	0.28	1.72	2.5	Off
13	CB-131	0.47	0.00	0.45	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.022	2.00	0.042	0.020	0.013	0.11	3.47	0.24	0.85	2.5	12
14	CB-133	0.34	0.00	0.34	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.022	2.00	0.042	0.020	0.013	0.10	2.87	0.23	0.48	2.5	13
15	CB-135	0.17	0.00	0.17	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.020	2.00	0.042	0.020	0.013	0.08	1.89	0.21	0.00	2.5	14
16	CB-136	0.59	0.03	0.54	0.08	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.14	4.91	0.28	1.61	2.5	34
17	CB-137	0.54	0.02	0.53	0.03	Comb	3.0	3.00	0.00	3.00	2.00	0.028	2.00	0.042	0.020	0.013	0.12	3.56	0.25	0.92	2.5	16
18	CB-138	0.90	0.01	0.79	0.12	Comb	3.0	3.00	0.00	3.00	2.00	0.028	2.00	0.042	0.020	0.013	0.14	4.60	0.27	1.54	2.5	34
19	CB-141	0.50	0.00	0.49	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.038	2.00	0.042	0.020	0.013	0.11	3.05	0.23	0.61	2.5	18
20	CB-143	0.04	0.00	0.04	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.007	2.00	0.042	0.020	0.013	0.05	1.29	0.21	0.00	2.5	21
21	CB-144	0.43	0.00	0.43	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	0.00	1.40	0.20	1.40	2.5	Off
22	CB-145	0.44	0.00	0.44	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	0.00	1.41	0.21	1.41	2.5	Off
23	CB-142	0.56	0.00	0.54	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.038	2.00	0.042	0.020	0.013	0.11	3.29	0.24	0.76	2.5	17

Project File: Storm System 100 - Inlets.stm | Number of lines: 45 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24	CB-113	0.16	0.14	0.29	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.012	2.00	0.042	0.020	0.013	0.11	3.14	0.23	0.61	2.5	6
25	CB-114	0.78	0.07	0.71	0.14	Comb	3.0	3.00	0.00	3.00	2.00	0.013	2.00	0.042	0.020	0.013	0.15	5.34	0.29	1.90	2.5	24
26	CB-116	0.73	0.00	0.66	0.07	Comb	3.0	3.00	0.00	3.00	2.00	0.026	2.00	0.042	0.020	0.013	0.13	4.19	0.26	1.29	2.5	25
27	CB-117	0.20	0.98	0.97	0.21	Comb	3.0	3.00	0.00	3.00	2.00	0.026	2.00	0.042	0.020	0.013	0.15	5.32	0.29	1.97	2.5	37
28	CB-121	0.60	2.15	1.76	0.98	Comb	3.0	3.00	0.00	3.00	2.00	0.020	2.00	0.042	0.020	0.013	0.21	8.12	0.36	5.18	2.5	27
29	CB-124	1.89	0.03	1.36	0.56	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.19	7.06	0.33	3.98	2.5	28
30	CB-125	0.50	0.00	0.47	0.03	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.12	3.75	0.25	1.00	2.5	29
31	CB-122	3.82	0.07	2.30	1.59	Comb	3.0	3.00	0.00	3.00	2.00	0.026	2.00	0.042	0.020	0.013	0.22	8.88	0.37	6.07	2.5	28
32	CB-123	0.69	0.00	0.61	0.07	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.13	4.46	0.27	1.42	2.5	31
33	CB-134	0.40	0.00	0.39	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.022	2.00	0.042	0.020	0.013	0.11	3.16	0.24	0.65	2.5	41
34	CB-139	0.84	0.19	0.83	0.21	Comb	3.0	3.00	0.00	3.00	2.00	0.013	2.00	0.042	0.020	0.013	0.16	5.86	0.30	2.44	2.5	35
35	CB-140	1.44	0.21	1.64	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	0.12	3.84	0.33	3.84	2.5	Off
36	CB-115	0.32	0.00	0.31	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.013	2.00	0.042	0.020	0.013	0.11	3.25	0.24	0.68	2.5	40
37	DI-118	0.07	0.21	0.28	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.05	7.18	0.05	7.18	0.0	Off
38	DI-119	0.56	0.00	0.56	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.08	10.16	0.08	10.16	0.0	Off
39	DI-120	2.66	0.00	2.66	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.013	0.23	25.07	0.23	25.07	0.0	Off
40	CB-128	0.52	0.01	0.49	0.04	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.13	4.09	0.26	1.18	2.5	12
41	CB-132	0.42	0.01	0.41	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.022	2.00	0.042	0.020	0.013	0.11	3.27	0.24	0.73	2.5	Off
42	CB-107	0.30	0.00	0.30	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.10	2.84	0.23	0.47	2.5	1
43	CB-103	0.29	0.11	0.38	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.11	3.33	0.24	0.74	2.5	Off
44	CB-104	0.41	0.00	0.39	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.11	3.40	0.24	0.79	2.5	Off
45	DI-110	0.38	0.00	0.38	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.06	8.27	0.06	8.27	0.0	Off

Project File: Storm System 100 - Inlets.stm | Number of lines: 45 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	DI-201	0.13	0.00	0.13	0.00	DrGrt	0.0	0.00	5.06	2.53	2.00	Sag	2.00	0.020	0.020	0.013	0.03	4.83	0.03	4.83	0.0	Off
2	CB-202	0.27	0.10	0.36	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.016	2.00	0.042	0.020	0.013	0.11	3.32	0.24	0.73	2.5	45
3	CB-206	0.71	0.02	0.63	0.10	Comb	3.0	3.00	0.00	3.00	2.00	0.012	2.00	0.042	0.020	0.013	0.15	5.07	0.28	1.73	2.5	2
4	CB-207	0.27	0.00	0.27	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.013	2.00	0.042	0.020	0.013	0.10	2.93	0.23	0.49	2.5	5
5	CB-208	0.92	0.02	0.94	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.013	0.08	2.00	0.29	2.00	2.5	Off
6	CB-209	0.88	0.00	0.88	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.013	0.08	2.00	0.29	2.00	2.5	Off
7	CB-210	0.30	0.01	0.31	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.039	2.00	0.042	0.020	0.013	0.09	2.19	0.21	0.00	2.5	6
8	CB-212	0.46	0.00	0.46	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.039	2.00	0.042	0.020	0.013	0.10	2.90	0.23	0.53	2.5	7
9	CB-214	0.40	0.01	0.40	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.039	2.00	0.042	0.020	0.013	0.10	2.66	0.22	0.38	2.5	8
10	CB-216	0.26	0.14	0.39	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.029	2.00	0.042	0.020	0.013	0.10	2.90	0.23	0.52	2.5	9
11	CB-217	0.26	0.00	0.26	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.029	2.00	0.042	0.020	0.013	0.09	2.16	0.21	0.00	2.5	34
12	CB-218	0.33	0.01	0.33	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.027	2.00	0.042	0.020	0.013	0.10	2.65	0.22	0.34	2.5	11
13	CB-220	0.32	0.00	0.32	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.014	2.00	0.042	0.020	0.013	0.11	3.18	0.24	0.65	2.5	12
14	CB-221	0.88	0.00	0.73	0.15	Comb	3.0	3.00	0.00	3.00	2.00	0.014	2.00	0.042	0.020	0.013	0.15	5.34	0.29	1.91	2.5	27
15	CB-222	0.38	0.00	0.37	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.012	2.00	0.042	0.020	0.013	0.12	3.67	0.25	0.91	2.5	3
16	CB-224	0.11	0.01	0.13	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.012	2.00	0.042	0.020	0.013	0.08	1.87	0.21	0.00	2.5	15
17	CB-227	0.33	0.02	0.33	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.012	2.00	0.042	0.020	0.013	0.11	3.47	0.24	0.80	2.5	16
18	CB-229	0.49	0.00	0.47	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.028	2.00	0.042	0.020	0.013	0.11	3.32	0.24	0.76	2.5	17
19	CB-230	0.89	0.05	0.95	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.013	0.08	2.00	0.29	2.00	2.5	Off
20	CB-233	0.83	0.07	0.90	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.013	0.08	2.00	0.29	2.00	2.5	Off
21	CB-234	0.20	0.02	0.21	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.040	2.00	0.042	0.020	0.013	0.08	1.82	0.21	0.00	2.5	20
22	CB-236	0.47	0.10	0.55	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.043	2.00	0.042	0.020	0.013	0.11	3.20	0.24	0.71	2.5	21
23	CB-242	0.84	0.03	0.77	0.10	Comb	3.0	3.00	0.00	3.00	2.00	0.030	2.00	0.042	0.020	0.013	0.13	4.43	0.27	1.44	2.5	22

Project File: Storm System 200 - Inlets.stm | Number of lines: 49 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24	CB-244	0.57	0.02	0.56	0.03	Comb	3.0	3.00	0.00	3.00	2.00	0.033	2.00	0.042	0.020	0.013	0.11	3.51	0.25	0.89	2.5	23
25	CB-246	0.56	0.00	0.54	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.039	2.00	0.042	0.020	0.013	0.11	3.24	0.24	0.72	2.5	24
26	CB-247	0.17	0.00	0.17	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.039	2.00	0.042	0.020	0.013	0.07	1.67	0.21	0.00	2.5	32
27	CB-219	0.84	0.15	0.85	0.14	Comb	3.0	3.00	0.00	3.00	2.00	0.027	2.00	0.042	0.020	0.013	0.14	4.83	0.28	1.67	2.5	10
28	DI-238	0.70	0.00	0.70	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.013	0.09	11.42	0.09	11.42	0.0	Off
29	DI-239	2.44	0.00	2.44	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.013	0.22	23.75	0.22	23.75	0.0	Off
30	DI-240	0.83	0.00	0.83	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.013	0.11	12.64	0.11	12.64	0.0	Off
31	DI-241	1.30	0.00	1.30	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.013	0.14	16.28	0.14	16.28	0.0	Off
32	CB-245	0.33	0.00	0.33	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.033	2.00	0.042	0.020	0.013	0.09	2.47	0.22	0.24	2.5	33
33	CB-243	0.39	0.00	0.39	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.030	2.00	0.042	0.020	0.013	0.10	2.84	0.23	0.47	2.5	35
34	CB-215	0.30	0.00	0.30	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.039	2.00	0.042	0.020	0.013	0.09	2.16	0.21	0.09	2.5	38
35	CB-237	0.32	0.01	0.32	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.043	2.00	0.042	0.020	0.013	0.09	2.18	0.21	0.00	2.5	41
36	CB-231	0.75	0.00	0.70	0.05	Comb	3.0	3.00	0.00	3.00	2.00	0.040	2.00	0.042	0.020	0.013	0.12	3.82	0.25	1.08	2.5	19
37	CB-232	0.84	0.00	0.77	0.07	Comb	3.0	3.00	0.00	3.00	2.00	0.040	2.00	0.042	0.020	0.013	0.12	4.04	0.26	1.21	2.5	20
38	CB-213	0.30	0.00	0.30	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.039	2.00	0.042	0.020	0.013	0.09	2.16	0.21	0.00	2.5	42
39	DI-225	1.68	0.00	1.68	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.013	0.17	19.00	0.17	19.00	0.0	Off
40	DI-226	0.86	0.00	0.86	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.013	0.11	12.83	0.11	12.83	0.0	Off
41	CB-235	0.60	0.00	0.57	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.040	2.00	0.042	0.020	0.013	0.11	3.35	0.24	0.79	2.5	43
42	CB-211	0.52	0.00	0.51	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.039	2.00	0.042	0.020	0.013	0.11	3.13	0.24	0.67	2.5	5
43	CB-228	0.87	0.02	0.74	0.16	Comb	3.0	3.00	0.00	3.00	2.00	0.012	2.00	0.042	0.020	0.013	0.16	5.57	0.29	2.06	2.5	44
44	CB-223	0.64	0.16	0.67	0.12	Comb	3.0	3.00	0.00	3.00	2.00	0.012	2.00	0.042	0.020	0.013	0.15	5.30	0.29	1.86	2.5	46
45	CB-203	0.14	0.01	0.15	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.020	2.00	0.042	0.020	0.013	0.08	1.80	0.21	0.00	2.5	Off
46	CB-204	1.20	0.12	1.04	0.29	Comb	3.0	3.00	0.00	3.00	2.00	0.020	2.00	0.042	0.020	0.013	0.16	5.94	0.31	2.66	2.5	Off

Project File: Storm System 200 - Inlets.stm | Number of lines: 49 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
47	DI-249	1.14	0.00	1.14	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.013	0.13	15.12	0.13	15.12	0.0	Off
48	DI-250	0.86	0.00	0.86	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.013	0.11	12.83	0.11	12.83	0.0	Off
49	DI-251	0.68	0.00	0.68	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.013	0.09	11.24	0.09	11.24	0.0	Off

Project File: Storm System 200 - Inlets.stm | Number of lines: 49 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	CB-301	1.40	0.10	1.08	0.41	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.19	7.28	0.33	4.00	2.5	Off
2	CB-302	1.20	0.02	0.93	0.29	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.18	6.66	0.32	3.30	2.5	Off
3	CB-303	0.35	0.08	0.41	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.12	3.66	0.25	0.93	2.5	2
4	DI-304	0.75	0.00	0.75	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.10	11.89	0.10	11.89	0.0	Off
5	DI-318	1.33	0.00	1.33	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.15	16.53	0.15	16.53	0.0	Off
6	DI-322	0.21	0.00	0.21	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.04	6.22	0.04	6.22	0.0	Off
7	CB-324	0.24	0.00	0.24	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.10	2.57	0.22	0.28	2.5	Off
8	CB-340	0.69	0.16	0.72	0.13	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.15	5.17	0.28	1.82	2.5	Off
9	CB-341	0.27	0.00	0.27	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.10	2.57	0.22	0.32	2.5	Off
10	CB-342	0.13	0.00	0.13	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.07	1.75	0.21	0.00	2.5	Off
11	CB-343	0.23	0.00	0.23	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.09	2.30	0.21	0.15	2.5	10
12	CB-351	0.07	0.02	0.09	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.06	1.48	0.21	0.00	2.5	13
13	CB-352	1.09	0.02	1.11	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	0.08	2.00	0.29	2.00	2.5	Off
14	CB-354	0.57	0.00	0.55	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.037	2.00	0.042	0.020	0.013	0.11	3.33	0.24	0.78	2.5	13
15	CB-356	0.34	0.00	0.34	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.040	2.00	0.042	0.020	0.013	0.09	2.31	0.21	0.10	2.5	14
16	CB-358	0.50	0.00	0.49	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.040	2.00	0.042	0.020	0.013	0.10	3.00	0.23	0.60	2.5	Off
17	CB-360	0.20	0.00	0.20	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.10	2.65	0.22	0.34	2.5	16
18	CB-361	0.12	0.00	0.12	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.017	2.00	0.042	0.020	0.013	0.07	1.69	0.21	0.00	2.5	19
19	CB-362	0.28	0.00	0.28	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.10	2.66	0.22	0.36	2.5	29
20	CB-363	0.23	0.00	0.23	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.09	2.34	0.22	0.16	2.5	30
21	DI-364	0.12	0.00	0.12	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.03	4.84	0.03	4.84	0.0	Off
22	DI-365	0.79	0.00	0.79	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.10	12.24	0.10	12.24	0.0	Off
23	CB-359	0.61	0.00	0.53	0.07	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.14	4.85	0.27	1.57	2.5	34

Project File: Storm System 300 - Inlets.stm | Number of lines: 67 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24	CB-325	0.27	0.01	0.28	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.020	2.00	0.042	0.020	0.013	0.10	2.58	0.22	0.32	2.5	7
25	CB-328	0.31	0.06	0.36	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.025	2.00	0.042	0.020	0.013	0.10	2.88	0.23	0.51	2.5	24
26	CB-330	0.37	0.20	0.50	0.06	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.14	4.70	0.27	1.49	2.5	25
27	CB-333	0.87	0.06	0.75	0.18	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.16	5.93	0.30	2.42	2.5	55
28	CB-334	0.47	0.12	0.53	0.06	Comb	3.0	3.00	0.00	3.00	2.00	0.012	2.00	0.042	0.020	0.013	0.14	4.58	0.27	1.44	2.5	27
29	CB-335	0.50	0.00	0.47	0.03	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.12	3.73	0.25	0.99	2.5	28
30	CB-336	0.49	0.00	0.47	0.03	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.12	3.71	0.25	0.98	2.5	28
31	CB-337	0.60	0.00	0.53	0.07	Comb	3.0	3.00	0.00	3.00	2.00	0.012	2.00	0.042	0.020	0.013	0.14	4.62	0.27	1.46	2.5	28
32	CB-338	1.01	0.00	0.81	0.20	Comb	3.0	3.00	0.00	3.00	2.00	0.012	2.00	0.042	0.020	0.013	0.16	5.89	0.30	2.44	2.5	26
33	DI-339	1.24	0.00	1.24	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.14	15.85	0.14	15.85	0.0	Off
34	CB-357	0.53	0.07	0.58	0.03	Comb	3.0	3.00	0.00	3.00	2.00	0.040	2.00	0.042	0.020	0.013	0.11	3.37	0.24	0.81	2.5	56
35	DI-331	0.46	0.00	0.46	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.07	9.17	0.07	9.17	0.0	Off
36	CB-344	0.44	0.00	0.42	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.020	2.00	0.042	0.020	0.013	0.11	3.43	0.24	0.82	2.5	12
37	CB-345	0.54	0.00	0.50	0.04	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.12	3.89	0.25	1.08	2.5	63
38	DI-346	0.35	0.00	0.35	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.06	7.92	0.06	7.92	0.0	Off
39	DI-347	0.46	0.00	0.46	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.07	9.15	0.07	9.15	0.0	Off
40	DI-348	0.32	0.00	0.32	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.06	7.64	0.06	7.64	0.0	Off
41	DI-349	0.49	0.00	0.49	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.07	9.43	0.07	9.43	0.0	Off
42	DI-350	0.46	0.00	0.46	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.07	9.18	0.07	9.18	0.0	Off
43	CB-305	0.65	0.17	0.74	0.08	Comb	3.0	3.00	0.00	3.00	2.00	0.031	2.00	0.042	0.020	0.013	0.13	4.26	0.26	1.34	2.5	3
44	CB-306	0.88	0.07	0.79	0.17	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.15	5.46	0.29	1.99	2.5	43
45	CB-307	0.50	0.24	0.64	0.10	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.14	4.84	0.28	1.63	2.5	1
46	CB-308	1.09	0.00	0.85	0.24	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.17	6.35	0.31	2.93	2.5	45

Project File: Storm System 300 - Inlets.stm | Number of lines: 67 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
47	CB-309	0.39	0.22	0.53	0.07	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.14	4.85	0.27	1.57	2.5	44
48	CB-310	0.25	0.04	0.28	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.011	2.00	0.042	0.020	0.013	0.11	3.20	0.24	0.64	2.5	47
49	CB-311	0.28	0.00	0.28	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.011	2.00	0.042	0.020	0.013	0.11	3.16	0.23	0.62	2.5	47
50	CB-313	0.73	0.01	0.67	0.07	Comb	3.0	3.00	0.00	3.00	2.00	0.028	2.00	0.042	0.020	0.013	0.13	4.14	0.26	1.26	2.5	Off
51	DI-314	1.15	0.00	1.15	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.13	15.19	0.13	15.19	0.0	Off
52	DI-315	0.40	0.00	0.40	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.07	8.53	0.07	8.53	0.0	Off
53	CB-316	0.43	0.00	0.42	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.029	2.00	0.042	0.020	0.013	0.10	3.01	0.23	0.59	2.5	50
54	CB-317	0.62	0.00	0.58	0.04	Comb	3.0	3.00	0.00	3.00	2.00	0.029	2.00	0.042	0.020	0.013	0.12	3.76	0.25	1.03	2.5	48
55	CB-329	0.77	0.18	0.81	0.13	Comb	3.0	3.00	0.00	3.00	2.00	0.025	2.00	0.042	0.020	0.013	0.14	4.82	0.28	1.66	2.5	60
56	CB-355	0.65	0.03	0.64	0.04	Comb	3.0	3.00	0.00	3.00	2.00	0.037	2.00	0.042	0.020	0.013	0.12	3.68	0.25	0.99	2.5	63
57	DI-319	0.87	0.00	0.87	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.11	12.93	0.11	12.93	0.0	Off
58	DI-320	0.98	0.00	0.98	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.12	13.83	0.12	13.83	0.0	Off
59	DI-321	0.74	0.00	0.74	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.10	11.80	0.10	11.80	0.0	Off
60	CB-327	0.86	0.13	0.83	0.16	Comb	3.0	3.00	0.00	3.00	2.00	0.020	2.00	0.042	0.020	0.013	0.15	5.20	0.29	1.87	2.5	8
61	CB-312	1.00	0.00	0.80	0.20	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.17	6.12	0.31	2.65	2.5	47
62	DI-326	0.99	0.00	0.99	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.12	13.90	0.12	13.90	0.0	Off
63	CB-353	1.45	0.08	1.52	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	0.11	3.40	0.32	3.40	2.5	Off
64	DI-323	0.78	0.00	0.78	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.10	12.16	0.10	12.16	0.0	Off
65	DI-367	0.73	0.00	0.73	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.013	0.10	11.71	0.10	11.71	0.0	Off
66	DI-368	0.51	0.00	0.51	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.08	9.68	0.08	9.68	0.0	Off
67	DI-369	0.55	0.00	0.55	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.08	10.01	0.08	10.01	0.0	Off

Project File: Storm System 300 - Inlets.stm | Number of lines: 67 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	CB-401	0.57	0.20	0.77	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.013	0.07	1.92	0.28	1.92	2.5	Off
2	CB-426	1.01	0.10	0.90	0.20	Comb	3.0	3.00	0.00	3.00	2.00	0.020	2.00	0.042	0.020	0.013	0.15	5.46	0.29	2.06	2.5	1
3	CB-427	0.37	0.06	0.42	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.022	2.00	0.042	0.020	0.013	0.11	3.30	0.24	0.75	2.5	43
4	CB-428	0.75	0.00	0.68	0.06	Comb	3.0	3.00	0.00	3.00	2.00	0.032	2.00	0.042	0.020	0.013	0.12	4.03	0.26	1.20	2.5	3
5	CB-429	0.30	0.00	0.30	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.032	2.00	0.042	0.020	0.013	0.09	2.32	0.21	0.00	2.5	4
6	CB-431	0.26	0.00	0.26	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.10	2.72	0.22	0.37	2.5	5
7	CB-433	0.04	0.00	0.04	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.014	2.00	0.042	0.020	0.013	0.05	1.13	0.21	0.00	2.5	6
8	CB-434	0.41	0.10	0.47	0.04	Comb	3.0	3.00	0.00	3.00	2.00	0.014	2.00	0.042	0.020	0.013	0.13	4.09	0.26	1.18	2.5	42
9	CB-435	0.48	0.00	0.46	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.022	2.00	0.042	0.020	0.013	0.11	3.50	0.24	0.87	2.5	8
10	CB-436	0.69	0.03	0.65	0.08	Comb	3.0	3.00	0.00	3.00	2.00	0.022	2.00	0.042	0.020	0.013	0.13	4.36	0.27	1.38	2.5	8
11	CB-438	0.14	0.00	0.14	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.09	2.06	0.21	0.00	2.5	10
12	CB-440	0.06	0.00	0.06	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.06	1.44	0.21	0.00	2.5	13
13	DI-441	1.13	0.00	1.13	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.13	15.06	0.13	15.06	0.0	Off
14	CB-445	0.37	0.00	0.36	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.11	3.22	0.24	0.69	2.5	Off
15	CB-446	0.22	0.00	0.22	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.09	2.28	0.21	0.00	2.5	Off
16	CB-448	0.69	0.18	0.78	0.08	Comb	3.0	3.00	0.00	3.00	2.00	0.038	2.00	0.042	0.020	0.013	0.13	4.16	0.26	1.29	2.5	Off
17	CB-455	0.60	0.19	0.73	0.06	Comb	3.0	3.00	0.00	3.00	2.00	0.038	2.00	0.042	0.020	0.013	0.12	3.98	0.26	1.17	2.5	Off
18	CB-456	0.15	0.00	0.15	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.016	2.00	0.042	0.020	0.013	0.08	1.89	0.21	0.00	2.5	17
19	CB-458	0.09	0.00	0.09	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.017	2.00	0.042	0.020	0.013	0.06	1.54	0.21	0.00	2.5	Off
20	CB-460	0.60	0.04	0.56	0.08	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.14	4.97	0.28	1.64	2.5	Off
21	CB-461	0.57	0.03	0.53	0.07	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.14	4.83	0.27	1.56	2.5	Off
22	CB-466	0.28	0.00	0.28	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.10	2.87	0.23	0.48	2.5	Off
23	DI-467	0.58	0.00	0.58	0.00	DrGrt	0.0	0.00	3.22	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.08	10.35	0.08	10.35	0.0	Off

Project File: Storm System 400 - Inlets.stm | Number of lines: 74 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24	DI-468	0.42	0.00	0.42	0.00	DrGrt	0.0	0.00	3.22	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.07	8.75	0.07	8.75	0.0	Off
25	DI-469	0.44	0.00	0.44	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.07	8.96	0.07	8.96	0.0	Off
26	DI-470	0.53	0.00	0.53	0.00	DrGrt	0.0	0.00	3.22	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.08	9.83	0.08	9.83	0.0	Off
27	CB-462	0.62	0.08	0.66	0.03	Comb	3.0	3.00	0.00	3.00	2.00	0.047	2.00	0.042	0.020	0.013	0.11	3.49	0.25	0.89	2.5	21
28	CB-464	0.91	0.00	0.83	0.08	Comb	3.0	3.00	0.00	3.00	2.00	0.047	2.00	0.042	0.020	0.013	0.12	4.04	0.26	1.22	2.5	27
29	CB-465	0.78	0.00	0.73	0.05	Comb	3.0	3.00	0.00	3.00	2.00	0.047	2.00	0.042	0.020	0.013	0.12	3.73	0.25	1.03	2.5	38
30	CB-449	0.91	0.17	0.90	0.18	Comb	3.0	3.00	0.00	3.00	2.00	0.025	2.00	0.042	0.020	0.013	0.15	5.13	0.29	1.85	2.5	16
31	CB-451	0.92	0.07	0.83	0.17	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.15	5.27	0.29	1.90	2.5	30
32	CB-453	0.68	0.00	0.61	0.07	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.13	4.39	0.27	1.38	2.5	31
33	CB-454	0.92	0.00	0.77	0.14	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.15	5.07	0.28	1.79	2.5	37
34	DI-442	1.09	0.00	1.09	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.13	14.69	0.13	14.69	0.0	Off
35	DI-443	1.31	0.00	1.31	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.14	16.39	0.14	16.39	0.0	Off
36	DI-444	0.52	0.00	0.52	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.08	9.72	0.08	9.72	0.0	Off
37	CB-452	0.99	0.14	0.91	0.22	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.16	5.60	0.30	2.22	2.5	40
38	CB-463	0.68	0.05	0.69	0.04	Comb	3.0	3.00	0.00	3.00	2.00	0.047	2.00	0.042	0.020	0.013	0.12	3.59	0.25	0.95	2.5	20
39	CB-437	0.53	0.00	0.50	0.03	Comb	3.0	3.00	0.00	3.00	2.00	0.020	2.00	0.042	0.020	0.013	0.12	3.81	0.25	1.04	2.5	10
40	CB-450	0.89	0.22	0.92	0.19	Comb	3.0	3.00	0.00	3.00	2.00	0.025	2.00	0.042	0.020	0.013	0.15	5.21	0.29	1.90	2.5	17
41	CB-439	0.09	0.00	0.09	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.07	1.67	0.21	0.00	2.5	Off
42	CB-432	0.46	0.04	0.46	0.04	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.12	3.98	0.26	1.12	2.5	63
43	CB-402	1.20	0.05	1.24	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	0.09	2.28	0.30	2.28	2.5	Off
44	CB-403	0.50	0.00	0.46	0.03	Comb	3.0	3.00	0.00	3.00	2.00	0.017	2.00	0.042	0.020	0.013	0.12	3.83	0.25	1.04	2.5	43
45	CB-404	0.57	0.00	0.54	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.035	2.00	0.042	0.020	0.013	0.11	3.38	0.24	0.80	2.5	Off
46	CB-406	0.26	0.00	0.26	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.014	2.00	0.042	0.020	0.013	0.10	2.80	0.23	0.42	2.5	47

Project File: Storm System 400 - Inlets.stm | Number of lines: 74 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
47	CB-408	0.56	0.22	0.78	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	0.07	1.93	0.28	1.93	2.5	Off
48	CB-410	1.04	0.00	0.82	0.22	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.17	6.23	0.31	2.78	2.5	47
49	CB-411	0.41	0.10	0.46	0.05	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.13	4.44	0.26	1.34	2.5	70
50	CB-412	0.54	0.17	0.60	0.10	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.15	5.20	0.28	1.78	2.5	49
51	CB-413	0.21	0.00	0.21	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.09	2.35	0.21	0.10	2.5	50
52	DI-414	2.15	0.00	2.15	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.20	21.98	0.20	21.98	0.0	Off
53	DI-415	1.26	0.00	1.26	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.14	15.99	0.14	15.99	0.0	Off
54	DI-416	0.59	0.00	0.59	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.08	10.42	0.08	10.42	0.0	Off
55	CB-447	0.28	0.00	0.28	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.10	2.69	0.22	0.36	2.5	Off
56	CB-457	0.15	0.00	0.15	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.016	2.00	0.042	0.020	0.013	0.08	1.89	0.21	0.00	2.5	Off
57	CB-459	0.09	0.00	0.09	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.017	2.00	0.042	0.020	0.013	0.06	1.54	0.21	0.00	2.5	Off
58	CB-417	0.21	0.00	0.21	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.09	2.35	0.21	0.10	2.5	50
59	CB-418	0.82	0.13	0.78	0.17	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.15	5.44	0.29	1.98	2.5	50
60	CB-421	0.98	0.01	0.87	0.13	Comb	3.0	3.00	0.00	3.00	2.00	0.035	2.00	0.042	0.020	0.013	0.13	4.55	0.27	1.52	2.5	59
61	CB-424	0.53	0.00	0.52	0.01	Comb	3.0	3.00	0.00	3.00	2.00	0.040	2.00	0.042	0.020	0.013	0.11	3.12	0.24	0.66	2.5	60
62	CB-425	0.41	0.00	0.41	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.040	2.00	0.042	0.020	0.013	0.10	2.66	0.22	0.37	2.5	64
63	CB-430	0.84	0.04	0.78	0.10	Comb	3.0	3.00	0.00	3.00	2.00	0.032	2.00	0.042	0.020	0.013	0.13	4.37	0.27	1.40	2.5	2
64	CB-422	0.52	0.00	0.51	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.035	2.00	0.042	0.020	0.013	0.11	3.24	0.24	0.73	2.5	67
65	DI-423	1.25	0.00	1.25	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.14	15.93	0.14	15.93	0.0	Off
66	CB-405	0.17	0.00	0.17	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.035	2.00	0.042	0.020	0.013	0.07	1.71	0.21	0.00	2.5	Off
67	CB-419	0.27	0.02	0.28	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.10	2.89	0.23	0.47	2.5	48
68	DI-420	0.85	0.00	0.85	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.11	12.81	0.11	12.81	0.0	Off
69	CB-407	0.10	0.00	0.10	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.014	2.00	0.042	0.020	0.013	0.07	1.65	0.21	0.00	2.5	70

Project File: Storm System 400 - Inlets.stm | Number of lines: 74 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
70	CB-409	1.82	0.05	1.87	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	0.14	4.65	0.35	4.65	2.5	Off
71	DI-472	0.10	0.00	0.10	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.03	4.57	0.03	4.57	0.0	Off
72	DI-473	0.32	0.00	0.32	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.06	7.57	0.06	7.57	0.0	Off
73	DI-474	0.65	0.00	0.65	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.09	11.05	0.09	11.05	0.0	Off
74	DI-475	1.19	0.00	1.19	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.13	15.47	0.13	15.47	0.0	Off

Project File: Storm System 400 - Inlets.stm | Number of lines: 74 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	CB-501	0.17	0.00	0.17	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.016	2.00	0.042	0.020	0.013	0.08	1.98	0.21	0.00	2.5	2
2	CB-515	0.10	0.00	0.10	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	-0.12	0.61	0.09	0.61	2.5	Off
3	CB-521	0.14	0.12	0.25	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	-0.06	1.03	0.15	1.03	2.5	Off
4	CB-522	0.14	0.00	0.14	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.011	2.00	0.042	0.020	0.013	0.08	1.95	0.21	0.00	2.5	5
5	CB-523	0.23	0.00	0.23	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.09	2.28	0.21	0.06	2.5	6
6	CB-524	0.45	0.00	0.43	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.11	3.52	0.24	0.86	2.5	52
7	CB-525	0.72	0.11	0.72	0.11	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.14	4.84	0.28	1.65	2.5	52
8	CB-527	0.85	0.08	0.82	0.11	Comb	3.0	3.00	0.00	3.00	2.00	0.032	2.00	0.042	0.020	0.013	0.13	4.50	0.27	1.49	2.5	7
9	CB-529	0.62	0.19	0.73	0.08	Comb	3.0	3.00	0.00	3.00	2.00	0.032	2.00	0.042	0.020	0.013	0.13	4.20	0.26	1.30	2.5	8
10	CB-537	0.19	0.10	0.29	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.032	2.00	0.042	0.020	0.013	0.09	2.28	0.21	0.00	2.5	45
11	CB-539	0.42	0.00	0.40	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.11	3.44	0.24	0.82	2.5	10
12	CB-542	0.03	0.00	0.03	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.012	2.00	0.042	0.020	0.013	0.05	1.13	0.21	0.00	2.5	11
13	CB-543	1.11	0.00	0.96	0.14	Comb	3.0	3.00	0.00	3.00	2.00	0.043	2.00	0.042	0.020	0.013	0.14	4.56	0.27	1.54	2.5	21
14	CB-544	0.82	0.00	0.76	0.07	Comb	3.0	3.00	0.00	3.00	2.00	0.043	2.00	0.042	0.020	0.013	0.12	3.92	0.26	1.15	2.5	22
15	CB-545	1.06	0.00	1.06	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	0.08	2.00	0.29	2.00	2.5	Off
16	CB-546	1.03	0.00	1.03	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	0.08	2.00	0.29	2.00	2.5	Off
17	CB-531	1.15	0.00	0.96	0.19	Comb	3.0	3.00	0.00	3.00	2.00	0.030	2.00	0.042	0.020	0.013	0.15	5.06	0.28	1.82	2.5	9
18	CB-533	1.11	0.00	0.89	0.22	Comb	3.0	3.00	0.00	3.00	2.00	0.016	2.00	0.042	0.020	0.013	0.16	5.76	0.30	2.37	2.5	Off
19	CB-535	1.56	0.00	1.14	0.42	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.18	6.80	0.32	3.60	2.5	Off
20	CB-536	1.29	0.00	0.99	0.30	Comb	3.0	3.00	0.00	3.00	2.00	0.015	2.00	0.042	0.020	0.013	0.17	6.25	0.31	2.95	2.5	27
21	CB-547	0.04	0.14	0.18	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.040	2.00	0.042	0.020	0.013	0.07	1.70	0.21	0.00	2.5	Off
22	CB-548	0.52	0.07	0.56	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.040	2.00	0.042	0.020	0.013	0.11	3.30	0.24	0.76	2.5	Off
23	DI-549	0.44	0.00	0.44	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.07	8.96	0.07	8.96	0.0	Off

Project File: Storm System 500 - Inlets.stm | Number of lines: 52 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24	DI-550	0.50	0.00	0.50	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.08	9.57	0.08	9.57	0.0	Off
25	DI-551	0.45	0.00	0.45	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.07	9.10	0.07	9.10	0.0	Off
26	DI-552	0.45	0.00	0.45	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.07	9.10	0.07	9.10	0.0	Off
27	CB-534	1.09	0.30	1.05	0.33	Comb	3.0	3.00	0.00	3.00	2.00	0.016	2.00	0.042	0.020	0.013	0.17	6.37	0.31	3.12	2.5	28
28	CB-532	1.23	0.33	1.22	0.35	Comb	3.0	3.00	0.00	3.00	2.00	0.030	2.00	0.042	0.020	0.013	0.16	5.84	0.30	2.62	2.5	31
29	CB-538	0.29	0.00	0.29	0.00	Comb	3.0	2.00	3.22	2.00	2.00	Sag	2.00	0.042	0.020	0.013	-0.02	1.29	0.19	1.29	2.5	Off
30	CB-540	0.56	0.00	0.52	0.04	Comb	3.0	3.00	0.00	3.00	2.00	0.018	2.00	0.042	0.020	0.013	0.12	4.03	0.26	1.16	2.5	10
31	CB-541	0.30	0.35	0.61	0.04	Comb	3.0	3.00	0.00	3.00	2.00	0.032	2.00	0.042	0.020	0.013	0.12	3.73	0.25	1.02	2.5	10
32	DI-530	0.66	0.00	0.66	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.09	11.09	0.09	11.09	0.0	Off
33	CB-502	0.17	0.00	0.17	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.016	2.00	0.042	0.020	0.013	0.08	1.98	0.21	0.00	2.5	1
34	CB-503	0.10	0.00	0.10	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.007	2.00	0.042	0.020	0.013	0.08	1.90	0.21	0.00	2.5	Off
35	CB-504	0.72	0.00	0.60	0.12	Comb	3.0	3.00	0.00	3.00	2.00	0.007	2.00	0.042	0.020	0.013	0.16	5.70	0.29	2.00	2.5	3
36	CB-505	0.22	0.00	0.22	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	-0.07	0.95	0.14	0.95	2.5	Off
37	CB-507	0.03	0.00	0.03	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.037	2.00	0.042	0.020	0.013	0.04	0.92	0.21	0.00	2.5	36
38	DI-508	0.17	0.00	0.17	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.04	5.62	0.04	5.62	0.0	Off
39	DI-511	2.09	0.00	2.09	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.20	21.62	0.20	21.62	0.0	Off
40	DI-512	0.71	0.00	0.71	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.10	11.52	0.10	11.52	0.0	Off
41	DI-513	0.94	0.00	0.94	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.11	13.50	0.11	13.50	0.0	Off
42	DI-514	1.52	0.00	1.52	0.00	DrGrt	0.0	0.00	4.00	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.16	17.88	0.16	17.88	0.0	Off
43	CB-509	0.37	0.00	0.37	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.038	2.00	0.042	0.020	0.013	0.09	2.54	0.22	0.26	2.5	37
44	CB-510	0.34	0.00	0.34	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.038	2.00	0.042	0.020	0.013	0.09	2.38	0.21	0.08	2.5	46
45	CB-528	0.50	0.00	0.48	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.032	2.00	0.042	0.020	0.013	0.11	3.21	0.24	0.71	2.5	47
46	CB-506	0.62	0.00	0.62	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	0.04	1.71	0.25	1.71	2.5	Off

Project File: Storm System 500 - Inlets.stm | Number of lines: 52 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
47	CB-526	0.31	0.02	0.32	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.019	2.00	0.042	0.020	0.013	0.10	2.89	0.23	0.48	2.5	52
48	CB-516	0.14	0.00	0.14	0.00	Comb	3.0	3.00	0.00	3.00	2.00	0.011	2.00	0.042	0.020	0.013	0.08	1.95	0.21	0.00	2.5	2
49	CB-517	0.37	0.00	0.36	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.013	2.00	0.042	0.020	0.013	0.11	3.53	0.24	0.84	2.5	51
50	CB-518	0.37	0.00	0.36	0.02	Comb	3.0	3.00	0.00	3.00	2.00	0.013	2.00	0.042	0.020	0.013	0.11	3.53	0.24	0.84	2.5	51
51	CB-519	0.97	0.03	0.80	0.20	Comb	3.0	3.00	0.00	3.00	2.00	0.010	2.00	0.042	0.020	0.013	0.17	6.12	0.31	2.65	2.5	52
52	CB-520	1.87	0.34	2.22	0.00	Comb	3.0	3.00	3.22	3.00	2.00	Sag	2.00	0.042	0.020	0.000	0.16	5.86	0.37	5.86	2.5	Off

Project File: Storm System 500 - Inlets.stm | Number of lines: 52 | Run Date: 11/16/2020

NOTES: Inlet N-Values = 0.016; Intensity = 3.97 / (Inlet time + 0.10) ^ 0.00; Return period = 1 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

GREENWAY CULVERT CALCULATIONS

The Point – South Pkg 1
AWH-20000

Culvert Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Tuesday, Nov 24 2020

Greenway Culvert 1

Invert Elev Dn (ft)	=	375.50
Pipe Length (ft)	=	28.00
Slope (%)	=	1.00
Invert Elev Up (ft)	=	375.78
Rise (in)	=	15.0
Shape	=	Circular
Span (in)	=	15.0
No. Barrels	=	1
n-Value	=	0.012
Culvert Type	=	Circular Concrete
Culvert Entrance	=	Groove end projecting (C)
Coeff. K,M,c,Y,k	=	0.0045, 2, 0.0317, 0.69, 0.2

Embankment

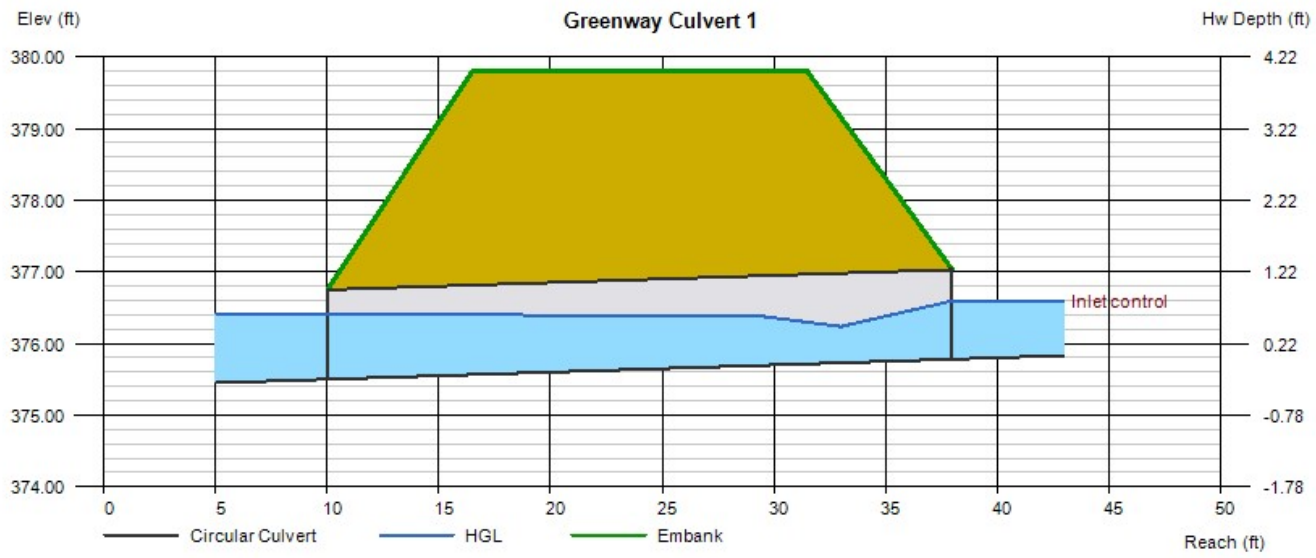
Top Elevation (ft)	=	379.80
Top Width (ft)	=	15.00
Crest Width (ft)	=	20.00

Calculations

Qmin (cfs)	=	2.13
Qmax (cfs)	=	2.13
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	2.13
Qpipe (cfs)	=	2.13
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	2.21
Veloc Up (ft/s)	=	3.78
HGL Dn (ft)	=	376.42
HGL Up (ft)	=	376.36
Hw Elev (ft)	=	376.59
Hw/D (ft)	=	0.65
Flow Regime	=	Inlet Control



Culvert Report

Greenway Culvert 2

Invert Elev Dn (ft)	=	387.00
Pipe Length (ft)	=	20.00
Slope (%)	=	1.00
Invert Elev Up (ft)	=	387.20
Rise (in)	=	15.0
Shape	=	Circular
Span (in)	=	15.0
No. Barrels	=	1
n-Value	=	0.012
Culvert Type	=	Circular Concrete
Culvert Entrance	=	Groove end projecting (C)
Coeff. K,M,c,Y,k	=	0.0045, 2, 0.0317, 0.69, 0.2

Embankment

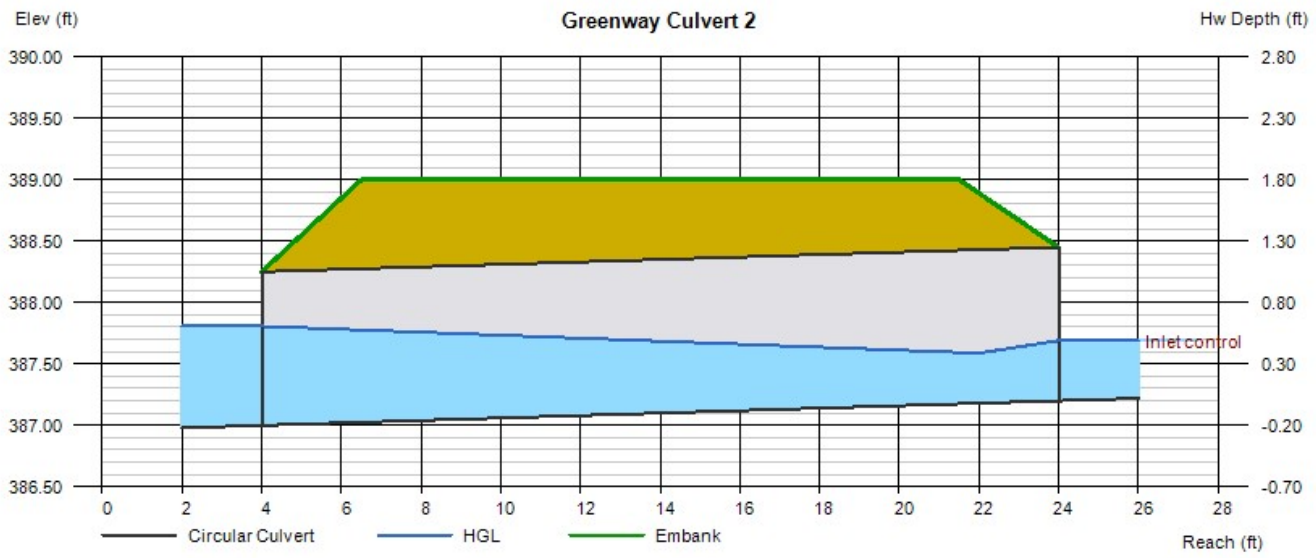
Top Elevation (ft)	=	389.00
Top Width (ft)	=	15.00
Crest Width (ft)	=	20.00

Calculations

Qmin (cfs)	=	0.86
Qmax (cfs)	=	0.86
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	0.86
Qpipe (cfs)	=	0.86
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	1.03
Veloc Up (ft/s)	=	2.90
HGL Dn (ft)	=	387.81
HGL Up (ft)	=	387.56
Hw Elev (ft)	=	387.69
Hw/D (ft)	=	0.39
Flow Regime	=	Inlet Control



Culvert Report

Greenway Culvert 3

Invert Elev Dn (ft)	=	383.50
Pipe Length (ft)	=	30.00
Slope (%)	=	1.00
Invert Elev Up (ft)	=	383.80
Rise (in)	=	15.0
Shape	=	Circular
Span (in)	=	15.0
No. Barrels	=	1
n-Value	=	0.012
Culvert Type	=	Circular Concrete
Culvert Entrance	=	Groove end projecting (C)
Coeff. K,M,c,Y,k	=	0.0045, 2, 0.0317, 0.69, 0.2

Embankment

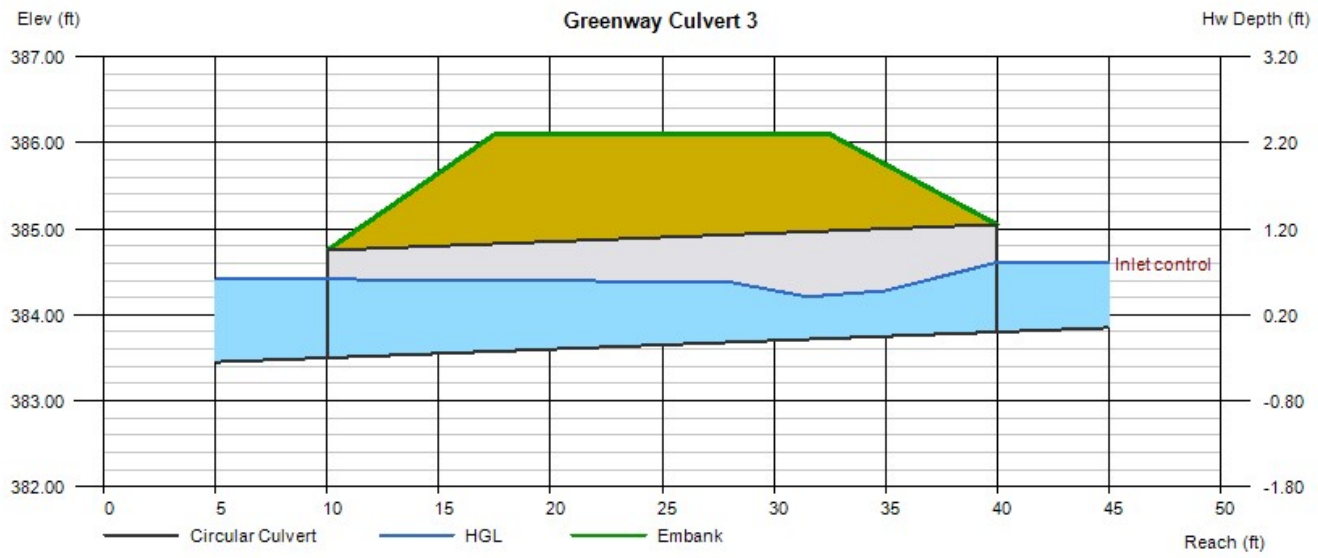
Top Elevation (ft)	=	386.10
Top Width (ft)	=	15.00
Crest Width (ft)	=	20.00

Calculations

Qmin (cfs)	=	2.10
Qmax (cfs)	=	2.10
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	2.10
Qpipe (cfs)	=	2.10
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	2.18
Veloc Up (ft/s)	=	3.76
HGL Dn (ft)	=	384.41
HGL Up (ft)	=	384.38
Hw Elev (ft)	=	384.61
Hw/D (ft)	=	0.65
Flow Regime	=	Inlet Control

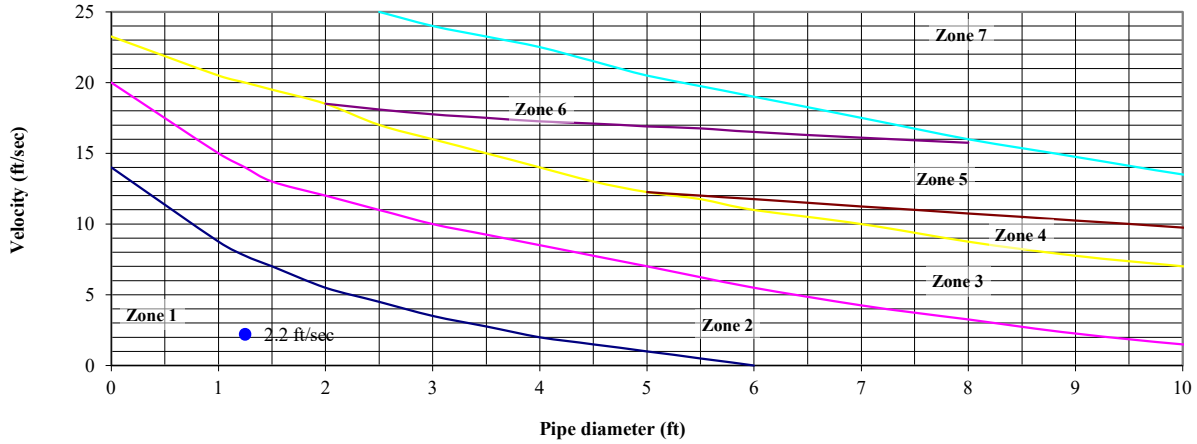


DESIGN OF RIPRAP OUTLET PROTECTION WORKSHEET

Project:	The Point South - Pkg 1	Date:	11/20/2020
Project Number:	AWH-20000	Calculated By:	WTO
Outlet Number:	Greenway Culvert 1		

Outlet flowrate =	2.13	cfs
Pipe diameter =	15	inches
Number of pipes =	1	
Pipe separation =	0	feet
Outlet Velocity =	2.21	ft/sec

Figure 8.06.b.1



Zone from graph above = 1

Outlet pipe diameter	15 in.	Length =	5.0 ft.
Outlet flowrate	2.1 cfs	Width =	3.3 ft.
Outlet velocity	2.2 ft/sec	Stone diameter =	3 in.
Material =	Class A	Thickness =	12 in.

Zone	Material	Diameter	Thickness	Length	Width
1	Class A	3	12	4 x D(o)	3 x D(o)
2	Class B	6	18	6 x D(o)	3 x D(o)
3	Class I	13	24	8 x D(o)	3 x D(o)
4	Class I	13	24	8 x D(o)	3 x D(o)
5	Class II	23	36	10 x D(o)	3 x D(o)
6	Class II	23	36	10 x D(o)	3 x D(o)
7	Special study required				

1. Calculations based on NY DOT method - Pages 8.06.05 through 8.06.06 in NC Erosion Control Manual

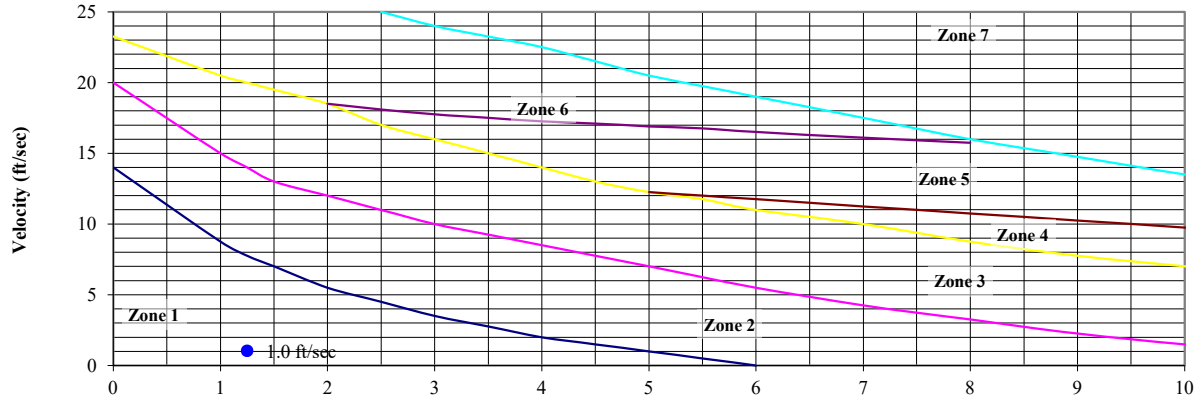
2. Outlet velocity based on full-flow velocity

DESIGN OF RIPRAP OUTLET PROTECTION WORKSHEET

Project:	The Point South - Pkg 1	Date:	11/20/2020
Project Number:	AWH-20000	Calculated By:	WTO
Outlet Number:	Greenway Culvert 2		

Outlet flowrate =	0.86	cfs
Pipe diameter =	15	inches
Number of pipes =	1	
Pipe separation =	0	feet
Outlet Velocity =	1.03	ft/sec

Figure 8.06.b.1



Zone from graph above = 1

Outlet pipe diameter	15 in.	Length =	5.0 ft.
Outlet flowrate	0.9 cfs	Width =	3.3 ft.
Outlet velocity	1.0 ft/sec	Stone diameter =	3 in.
Material =	Class A	Thickness =	12 in.

Zone	Material	Diameter	Thickness	Length	Width
1	Class A	3	12	4 x D(o)	3 x D(o)
2	Class B	6	18	6 x D(o)	3 x D(o)
3	Class I	13	24	8 x D(o)	3 x D(o)
4	Class I	13	24	8 x D(o)	3 x D(o)
5	Class II	23	36	10 x D(o)	3 x D(o)
6	Class II	23	36	10 x D(o)	3 x D(o)
7	Special study required				

1. Calculations based on NY DOT method - Pages 8.06.05 through 8.06.06 in NC Erosion Control Manual

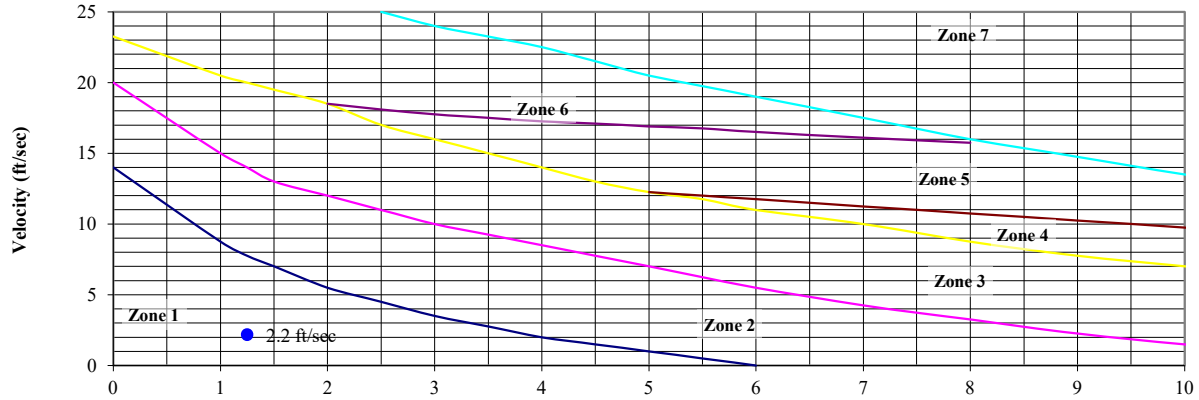
2. Outlet velocity based on full-flow velocity

DESIGN OF RIPRAP OUTLET PROTECTION WORKSHEET

Project:	The Point South - Pkg 1	Date:	11/20/2020
Project Number:	AWH-20000	Calculated By:	WTO
Outlet Number:	Greenway Culvert 3		

Outlet flowrate =	2.1	cfs
Pipe diameter =	15	inches
Number of pipes =	1	
Pipe separation =	0	feet
Outlet Velocity =	2.18	ft/sec

Figure 8.06.b.1



Zone from graph above = 1

Outlet pipe diameter	15 in.	Length =	5.0 ft.
Outlet flowrate	2.1 cfs	Width =	3.3 ft.
Outlet velocity	2.2 ft/sec	Stone diameter =	3 in.
Material =	Class A	Thickness =	12 in.

Zone	Material	Diameter	Thickness	Length	Width
1	Class A	3	12	4 x D(o)	3 x D(o)
2	Class B	6	18	6 x D(o)	3 x D(o)
3	Class I	13	24	8 x D(o)	3 x D(o)
4	Class I	13	24	8 x D(o)	3 x D(o)
5	Class II	23	36	10 x D(o)	3 x D(o)
6	Class II	23	36	10 x D(o)	3 x D(o)
7	Special study required				

1. Calculations based on NY DOT method - Pages 8.06.05 through 8.06.06 in NC Erosion Control Manual

2. Outlet velocity based on full-flow velocity